TAB U

AIRCRAFT MAINTENANCE RECORDS

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1. FROM		3. MDS	4. NUMBER
20030213		MH-53M	68-[illegible]30

5. Certification of PR, PR/BPO, PR/TH, TH, BPO, QT, ICT, WAI, PLI

FLT NO	TYPE	ACCOMPLISHED BY	COMPLETED DATE	COMPLETED TIME	FLT NO	TYPE	ACCOMPLISHED BY	COMPLETED DATE	COMPLETED TIME
	PR	9R ES 02B05	20030213	0430					

6. STATUS DATA — SEE AFTO FORMS 781A AND 781K FOR EXPLANATION OF THE STATUS SYMBOLS

7. FLIGHT CONDITION DATA

STATUS TODAY		BOX NO	EXCEPTIONAL RELEASE (Enter Box No)	FLT NO	COND / AFT FLT	PILOT'S SIGNATUARE (Enter After Each Flight)	OVER TEMP ENCTRD	AUX ENG OR APU OPERATION
~~1~~	13	2	[illegible]	1				
~~2~~	14			2				
3	15			3				
4	16			4				
5	17			5				
6	18			6				
7	19			7				
8	20			8				
9	21			9				
10	22			10				
11	23			11				
12	24			12				

8. MUNITIONS/ GUNS	STATUS 781A	L E N / P I	L E N / P I	L E N / P I	L E N / P I	L E N / P I	L E N / P I	TOTAL TODAY

9. AIRFRAME TIME		10. LANDINGS FULL STOP	10. LANDINGS TOTAL	11. CART/JFS STARTS NO	ENG	NO	ENG	12. ENGINE CYCLE DOCUMENTATION NO 1 ENG	NO 2 ENG	NO 3 ENG	NO 4 ENG	NO 5 ENG	NO 6 ENG	NO 7 ENG	NO 8 ENG
PREVIOUS	9033.7														
FLIGHTS 1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
TOTAL															

PREVIOUS EDITION IS OBSOLETE

AFTO FORM 781H, 19990806 (EF-V1) AEROSPACE VEHICLE FLIGHT STATUS AND MAINTENANCE

INSPECTION/TCTO PLANNING CHECKLIST

INSPECTION/TCTO PLANNING CHECKLIST										1. DATE PREPARED 07-Aug-02
2. UNIT 16 HGS		3. Activity A PHASE				4. FLIGHT/SECTION				
5. AIRCRAFT MDS: MH53J	SERIAL NUMBER: A0930	6. INSPECTION NUMBER ☐ CALENDAR ■ TIME			7. DOCK NUMBER PHASE			8. START TIME/DATE 20-Aug-02		9. DATE PREPLAN MEETING SCHEDULED 20-Aug-02
10. ACFT TIME AT INSP	11. ACFT LAST INSP	12. ENGINE TIME	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6	NO. 7	NO. 8
A. ESTIMAT 8885.4	A. TIME 8593.9	A. ESTIMATED	E1122	E1162						
B. Actual 8871.2	B. DATE 18-Aug-01	B. ACTUAL	1143.7	274.1						
13. DATE DUE OUT OF INSP 04-Sep-02										

14. PREPLAN MEETING PARTICIPANTS AND DISCUSSION ITEMS

ACTIVITY	NAME	DISCUSSION ITEMS
PRE-DOCK		**PHASE JCN: 02233A001**
PHASE	E-5 01153	Crew chief is responsible for working 781K, **CW PN / SN**
Production	MSgt 00215	**Inventory**, Special Insp, all open write-ups prior to PHASE, and
Crew Chief	E5 1142	removing and reinstalling floors if under-floor insp is required.
Engines ~~AFETS~~	E-5 00287	4-3825
NOV 2		One or more crew chiefs will be required to work each shift to
P&S	Rosario A1C	include weekends (12 Hrs). Weekends are counted as duty
POST-DOCK		days and are part of the 15 day PHASE flow.
PHASE	E5 1153	
Production	01332 ~~01529~~	
Crew Chief		
Engines ~~AFETS~~	02876	
NOV 2		
P&S	McCook	

15. ADDITIONAL SPECIALIST TASKS

SHOP	TASKS
HFLT ~~HDCK~~	**ACCOMPLISH ALL LOCAL INSPECTION WITHIN 20%**
HFLT	SERIAL # INVENTORY : 022330018
HFLT	PRE DOCK DOCUMENT REVIEW: 022340013
HFLT	NDI TAIL TAKE OFF GEAR: (**TIME REMAINING:** 300 ~~30.7~~) ~~: 02233009~~

:elease: 1268-6 H53 DART HURLBURT A/C 68-10930 01

:hip To: AIR FORCE (W.R.SOF) Entered: 03/06/02 HERRERA , M G

LEXINGTON,KY Revised: 03/06/02 HERRERA , M G

JOG 70 P.C. Priority: 00 50

3-6 Location: H

:atalogue: 107 NOSE LANDING ARE 107 NOSE LANDING AREA DAMAGE

:rawing: Revision: WBS: 1311

:hip Item: Finish:

:uantity: 1.000 Weight: DIM A:

:sed On:

O P E R A T I O N S

KCT	NO	DESCRIPTION	MCH HRS	SETUP	RUN	TOTAL
999	0	***** REVISION: INITIAL *****	0.0	0.00	0.0000	0.0

:RELEASE WO/OPER

****

CAUTION:

This item shall be REPAIRED/INSTALLED/TESTED in a FOD awareness area. All work procedures are to be IAW Raytheon Directive D6003. Subject material is to be read and understood before work is performed.

****

ATTN:

REPAIR, INSTALL AND TEST SHALL BE PERFORMED PER CUSTOMER GUIDANCE AND RAYTHEON APPLICABLE JOINT PROCESS SPECIFICATIONS (JPS) .

****

J03	5	ASSIST CUSTOMER AS REQD PER APPLICABLE	0.0	0.00	0.0000	0.0

:ELEASE WO/OPER

TD

DESCP OF WORK:

Cantered Bulkhead NOSE W/W, Colective tube box and LWR skin nose Extension crushed. Repaired damage IAW 1H-53(M)J-3

PERF BY Lf 151 DATE 5Apr02 LV1 LHL 114 49 DATE 5APR02

WORK ORDER 0026

RJ01 10 ASSIST CUSTOMER AS REQD PER APPLICABLE 0.0 0.00 0.0000 0.0

RELEASE WO/OPER

TD

DESCP OF WORK:

removed and reinstalled components for nose repair

PERF BY I-I 20 DATE_____ LV1 I-II 39 DATE 15APR02

JE02 15 ASSIST CUSTOMER AS REQD PER APPLICABLE 0.0 0.00 0.0000 0.0

RELEASE WO/OPER

TD

DESCP OF WORK:

REMOVED AND REINSTALLED COMPONENTS FOR NOSE REPAIR

PERF BY I-II 39 DATE_____ LV1 I-II 143 DATE 15APR02

MH00 20 ASSIST CUSTOMER AS REQD PER APPLICABLE 0.0 0.00 0.0000 0.0

RELEASE WO/OPER

TD

DESCP OF WORK:

N/A MJB 15/04/02

PERF BY_____ DATE_____ LV1_____ DATE_____

RZ00 25 ASSIST CUSTOMER AS REQD PER APPLICABLE 0.0 0.00 0.0000 0.0

RELEASE WO/OPER

TD

DESCP OF WORK:

N/A MJB 15APR02

GOVMNT REP_____ DATE_____

WORK ORDER 0026

(Please Print Name/Title)

1999 30 UPON COMPLETION FORWARD TO FT.WALTON PPC 0.0 0.00 0.0000 0.0

RELEASE WO/OPER

OFFICE .

W O R K   O R D E R   0026

(Pleas rint Name/Title)

'999 30 UPON COMPLETION FORWARD TO FT.WALTON PPC 0.0 0.00 0.0000 0.0

RELEASE   WO/OPER

OFFICE .

TAB W

WEATHER OBSERVATIONS

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Ali Al Salem

SURFACE OBSERVATION REQUEST

Bottom Close

STATION: EQAD/998530 ELEVATION: 476 FEET
CITY: ALI AL SALEM UK MET LAT/LONG: 29.35N / 047.82E

```
EQAD 131950Z 34010KT 8000 HZ FEW025 BKN040 17/14 Q1009;
EQAD 131850Z 19002KT 9000 HZ BKN025 BKN040 17/14 Q1009 RETSRA;
EQAD 131750Z 11009KT 9000 HZ SCT035 BKN040 17/14 Q1008;
EQAD 131650Z 10007KT 9000 HZ FEW037 SCT040 BKN090 17/14 Q1008;
EQAD 131550Z 07006KT 9000 TSRA FEW037 BKN045 BKN090 17/15 Q1009;
EQAD 131450Z 02009KT 8000 TSRA FEW035 BKN045 BKN090 18/13 Q1009;
EQAD 131350Z 11008KT 8000 DU FEW090 SCT130 BKN200 20/12 Q1008;
EQAD 131250Z 14014KT 8000 DU FEW140 BKN200 23/05 Q1008;
EQAD 131150Z 15016KT 7000 BLDU BKN140 23/04 Q1008;
EQAD 131050Z 15015G25KT 5000 BLDU BKN140 23/03 Q1009;
EQAD 130950Z 14017KT 5000 BLDU BKN140 21/03 Q1010;
EQAD 130850Z 14014G25KT 3500 BLDU BKN140 20/01 Q1011;
EQAD 130750Z 14014KT 5000 BLDU FEW100 BKN140 BKN200 20/02 Q1012;
EQAD 130650Z 13012KT 8000 HZ FEW140 BKN200 19/03 Q1012;
EQAD 130550Z 12013KT 9999 FEW140 BKN200 17/03 Q1013;
EQAD 130450Z 15011KT 9999 FEW140 BKN200 15/01 Q1013;
EQAD 130350Z 13005KT 9999 SCT120 BKN200 14/02 Q1013;
EQAD 130250Z 12004KT 9999 SCT140 BKN180 15/02 Q1013;
EQAD 130150Z 15003KT 9999 BKN120 BKN200 16/M02 Q1013;
EQAD 130050Z 18004KT 9999 -RA BKN100 BKN200 14/03 Q1015;
EQAD 122350Z 29002KT 9999 SCT110 BKN200 14/04 Q1015;
EQAD 122250Z 17001KT 9999 FEW110 SCT200 BKN250 14/02 Q1015;
EQAD 122050Z 00000KT 9999 SCT160 BKN250 15/01 Q1016;
EQAD 121950 00000KT 9999 BKN180 BKN250 15/01 Q1017;
EQAD 121750Z 27002KT 9999 BKN250 16/M00 Q1018;
EQAD 121650Z 14002KT 9999 BKN250 18/M06 Q1018;
EQAD 121550Z 08003KT 9999 FEW180 BKN250 19/M03 Q1018;
EQAD 121450Z 00000KT 9999 BKN180 BKN250 19/M06 Q1018;
EQAD 121350Z 04005KT 9999 FEW160 BKN250 21/M08 Q1017;
```

Top Close

? 150

050 05KT 9999 ovc 240 00/-02 PA +1064 30.16

-MOD 150-180 ICG

Ali AT[4] Salem

SURFACE OBSERVATION REQUEST

Bottom Close

STATION: KQGV/698084 **ELEVATION:** 479 FEET
CITY: ALI AL SALEM KUWAIT **LAT/LONG:** 29.77N / 047.52E

698084 KQGV Data not available. Try again later.

```
AMD KQGV 131715 12012KT 8000 BLDU VCTS FEW040CB SCT090 SCT130 BKN200 QNH2983INS
     TEMPO 1719 13015G25KT 4800 -TSRA BLDU
     TEMPO 1922 23025G45KT 3200 -TSRA BLDU
     BECMG 2122 14010G15KT 6000 BLDU VCSH FEW040 SCT090 BKN100 BKN200 QNH2975INS
     BECMG 0102 31012KT 9999 NSW SCT120 BKN200 QNH2977INS
     BECMG 0607 32010G15KT 4800 BLDU SCT100 SCT250 QNH2979INS
     BECMG 1415 31012KT 8000 HZ FEW250 QNH2980INS T22/22Z T14/03Z AMD 1719;
```

Top Close

Camp Udairi

SURFACE OBSERVATION REQUEST

Bottom Back

STATION: KQWM/698264 ELEVATION: 0 FEET
CITY: RESERVED FOR AFWA LAT/LONG: 00.00 / 000.00

An * below means that this data has not been decoded or validated

NONE VALID SPECIAL

* KQWM 698264 17 307894 SPECI KQWM 132140Z 20003KT 6000 HZ BKN210 16/M02 A3008 RMK ESTMD ALSTG;

* KQWM 698264 17 307893 METAR KQWM 132055Z VRB03KT 7000 BR FEW030 SCT100 16/14 A2988 RMK SLP116 ESTMD ALST

* KQWM 698264 17 307892 METAR KQWM 131955Z VRB03KT 7000 BR SCT030 SCT100 16/14 A2988 RMK SLP117 ESTMD ALST

* KQWM 698264 17 307890 METAR KQWM 131823Z COR VRB03KT 8000 BR FEW050 BKN100 OVC200 17/14 A2990 RMK ESTMD

* KQWM 698264 17 307890 METAR KQWM 131820Z VRB03KT 800 BR FEW050 BKN100 OVC200 17/14 A2990 RMK ESTMD ALSTG

* KQWM 698264 17 307890 METAR KQWM 131755Z VRB04KT 6000 -SHRA BR SCT040 OVC090 17/14 A2985 RMK TS 12N-NE M

* KQWM 698264 17 307890 SPECI KQWM 131738Z VRB04KT 6000 -SHRA BR SCT040 OVC090 17/14 A2985 RMK TS 12N-NE M

* KQWM 698264 17 307889 METAR KQWM 131655Z 13015KT 100V160 7000 BR SCT050 OVC090 17/14 A2984 RMK LTG DSNT

* KQWM 698264 17 307888 METAR KQWM 131555Z 13015G20 080V130 8000 VCTS FEW050 BKN090 BKN120 17/14 A2984 RMK

* KQWM 698264 17 307887 SPECI KQWM 131510Z 13014KT 4800 -SHRA FEW050 BKN120 OVC200 17/14 A2985 RMK TS MOV

* KQWM 698264 17 307887 SPECI KQWM 131455Z 11010KT 4800 -TSRA FEW050CB BKN120 OVC200 17/13 A2986 RMK TS OH

* KQWM 698264 17 307887 SPECI KQWM 131441Z 11010KT 3200 TS FEW050CB BKN120 OVC200 17/13 A2986 RMK TS OHD M

* KQWM 698264 17 307886 SPECI KQWM 131407Z 10008KT 070V130 3200 -TSRA FEW050CB BKN120 OVC200 18/12 A2988 R

* KQWM 698264 17 307886 METAR KQWM 131355Z 09008KT 070V130 6000 TS BLDU FEW050CB BKN120 BKN140 OVC200 18/1

* KQWM 698264 17 307886 METAR KQWM 131345Z 09010KT 060V130 6000 TS BLDU FEW050CB BKN120 BKN150 OVC200 18/1

W-5

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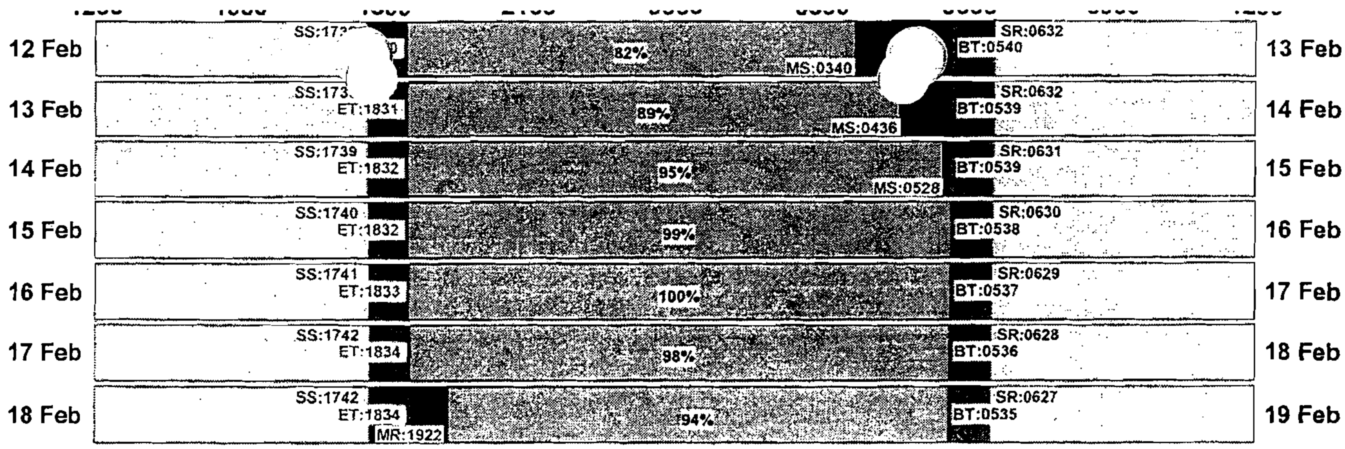

12 Feb
SS:173
82%
MS:0340
SR:0632
BT:0540
13 Feb
13 Feb
SS:173
ET:1831
89%
MS:0436
SR:0632
BT:0539
14 Feb
14 Feb
SS:1739
ET:1832
95%
MS:0528
SR:0631
BT:0539
15 Feb
15 Feb
SS:1740
ET:1832
99%
SR:0630
BT:0538
16 Feb
16 Feb
SS:1741
ET:1833
100%
SR:0629
BT:0537
17 Feb
17 Feb
SS:1742
ET:1834
98%
SR:0628
BT:0536
18 Feb
18 Feb
SS:1742
ET:1834
MR:1922
94%
SR:0627
BT:0535
19 Feb

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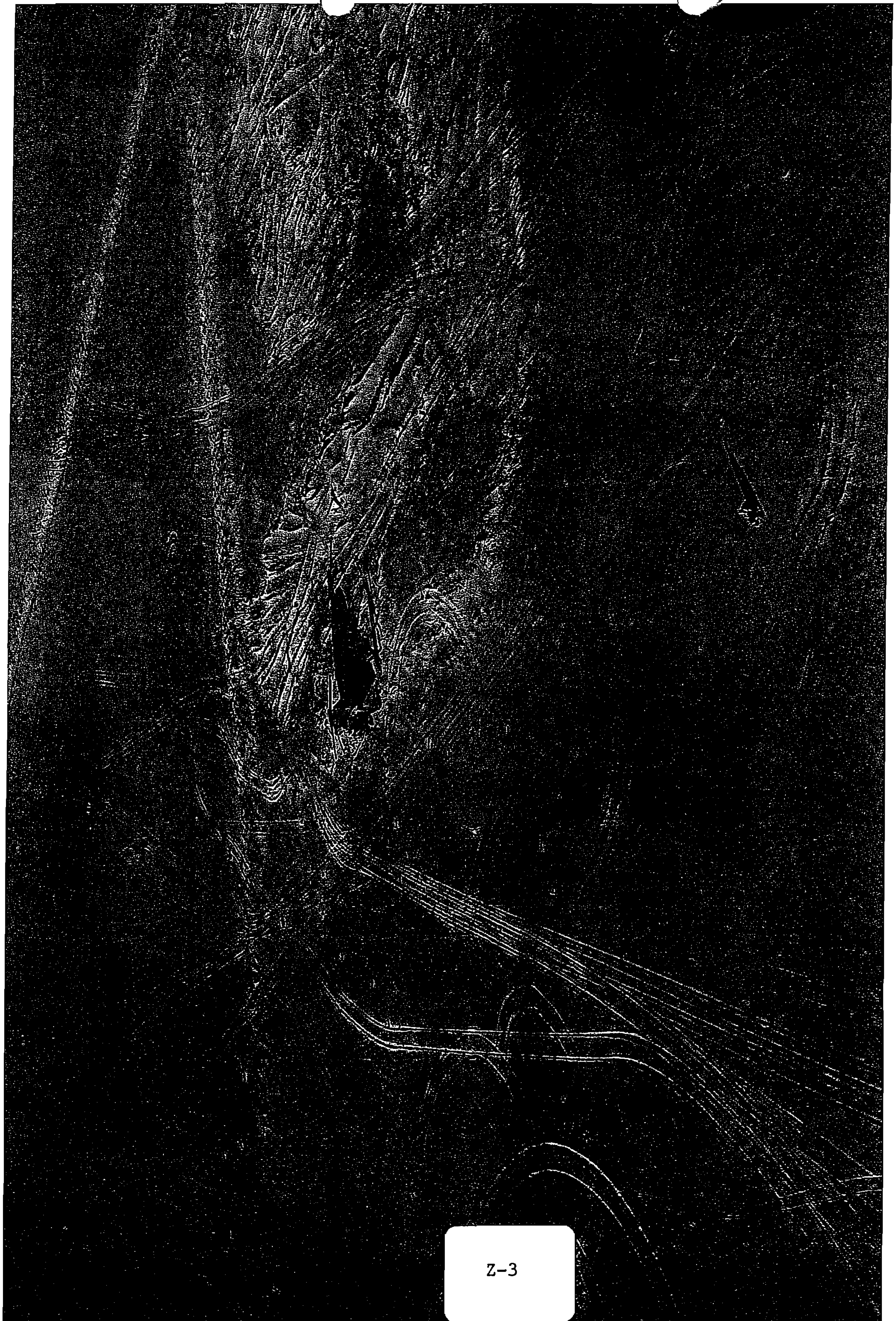
TAB Z

PHOTOGRAPHS



Z-3

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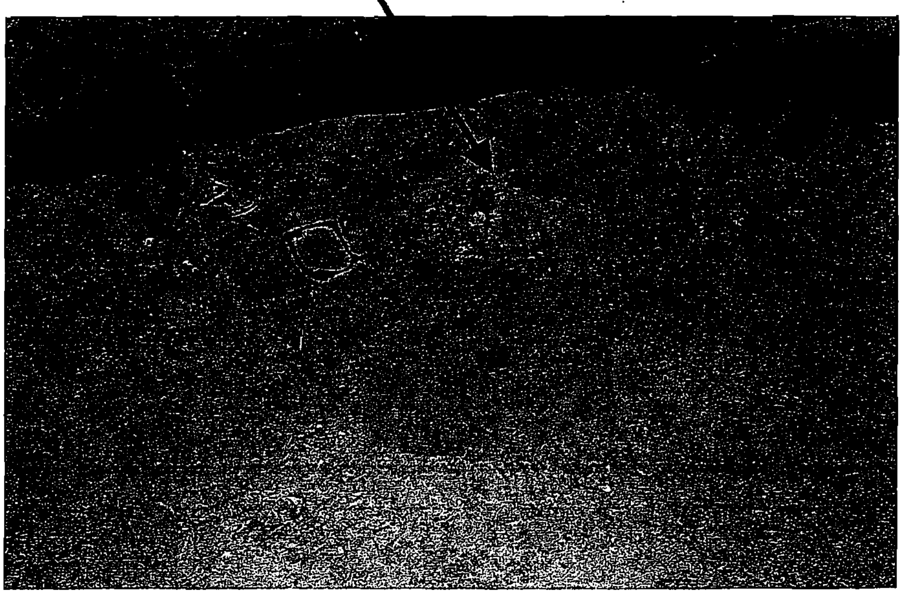
Trench plowed by
nose landing gear

Nose landing gear collapsed
and continued forward
movement

Forward movement of
collapsed gear pushed up
dirt mound



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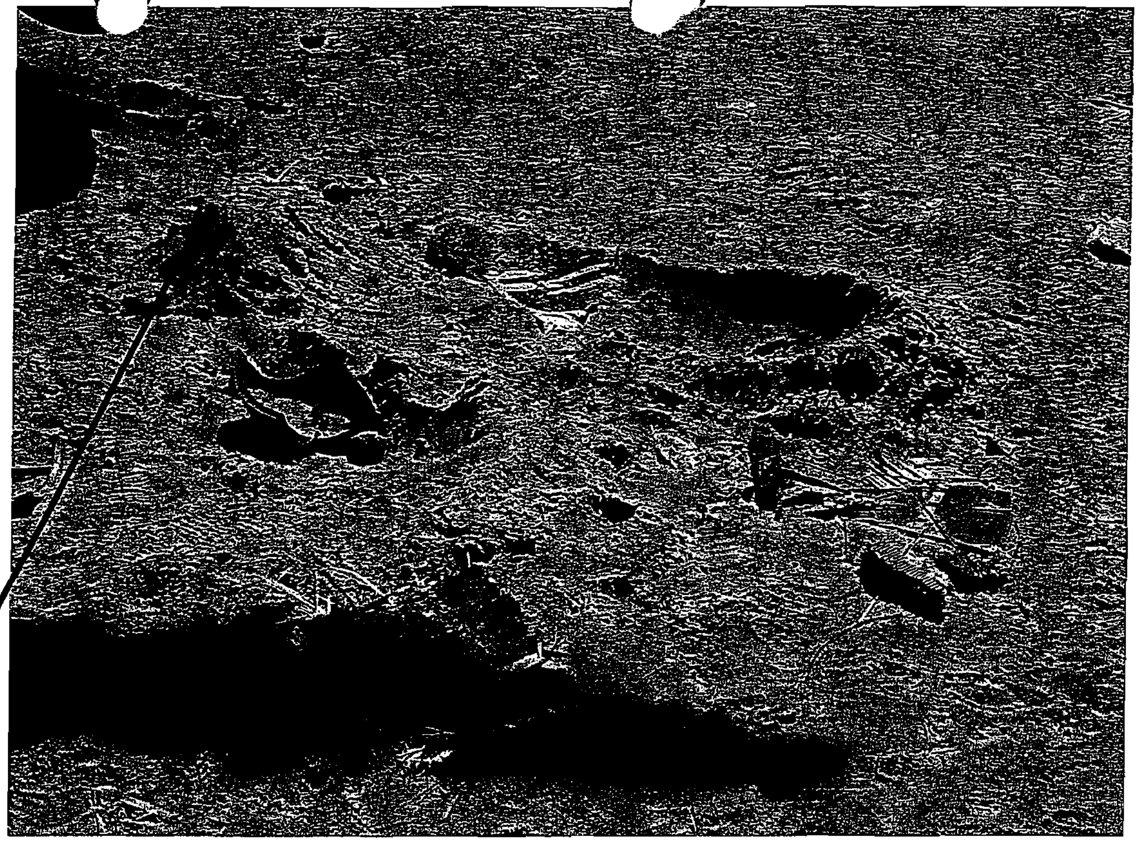

Dirt Mound

Collapsed nose
wheel impression

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OIL TEMP
TEMP
PRESS
LOW
ALT
WARN
PITCH AND ROLL
CONTROL
ENGAGE

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TAB AA

FLIGHT DOCUMENTS

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FRAG SHEET

2/12/03 22:05 — SECRET

Check In Freqs	FM	30.80	UHF	233.40	VHF	119.175	SAT Up	297.275°U
	PLS	297.0	HQ II	A11.950	HF		SAT Down	263.675°D

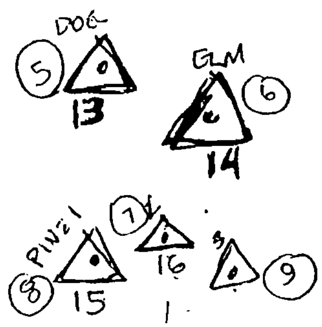
Timeline	Seats	Comm	Load	Start	Release	Taxi	Takeoff
	~~1430Z~~	1450Z	1445Z	1500Z	1502Z	1520Z	1530Z

Callsign / Tail #	Mode 2 / Mode 3	Crew			Fuel Load/Pax	RADAR / TACAN	Weapons	Ammo	FM	UHF	VHF	PLS	HQ	SAT
RAKE 13 ~~12~~	N/A				3.8	1	M	M				P		P
13	2720				OPV 6	29Y	3K	7.62		S	S			S
RAKE 14 ~~13~~	N/A				3.8	2-3	M	M				P	P	P
14	2720				27 ACL	92Y	3K	7.62		S			S	S
15 ~~14~~	N/A				3.8	4	M	M				P		P
15	2720				OPV 6	92Y	3K	7.62		S			S	S
RAKE 16 ~~15~~	~~N/A~~ 930	WOODWORTH / REECE	KERWOOD / BOWLING	PHILLIPS / MARESH	3.8	5-6	M	M				P	P	P
16	2720				OPV 3 16	92Y	3K	7.62	S	S			S	S
RAKE 12 ~~16~~	N/A				7.0	7	M	M	P	P	P	P	P	P
12	2720					92Y	3K	7.62	S	S	S		S	S
							M	M	P	P	P	P	P	P
								7.62	S	S	S		S	S
							M	M	P	P	P	P	P	P
								7.62	S	S	S		S	S
							M	M	P	P	P	P	P	P
								7.62	S	S	S		S	S

MOON DATA (Z)	
SS	1438
EENT	1531
MR	N/A
ILLUM	89%
MS	0135
BMNT	0239
SR	0331

HQ II	
20	285.650
19	280.600
18	291.300
17	233.600
16	253.800
15	385.400
14	313.000

NOTES



4 PICK UP
ACL ONLY
LEFT TRAFFIC

RAKE 16

FRAG SHEET v2.0 — SECRET

Comm Matrix	1 Common	2 COMMAND	3 OKAS	4 Kuwait	5 Alternate	6 Team	7	8	9 Misc
A	Pri 30.80	JSOAC AIR 297.275°U 263.675°D	Salem Gnd 250.1	Jaber Gnd 309.0	Jaber Gnd 127.0	Pri ~~263.75~~	263.75		SAR A-246.525 B-276.075
B	Sec 119.175	AFSOD-S *Falcon Sierra* 237.60	Salem Twr 303.0	Jaber Twr 301.5	Jaber Twr 141.5	~~Sec 255.10*~~			AWACS TOD 390.2
C	Ter 233.40			Jaber Cont 302.0	Jaber App 128.3	Ter 30.80*			
D	PLS 297.00	CRC-HQII *ABSOLUT* A11.550		Udairi Rng 355.0	Udairi Rng 133.0				
E	HQ common A11.950 A12.050	CRC-U *ABSOLUT*		Udairi Twr 130.0	Salem Gnd/ Twr 118.0		130	-	
F			CC Post *Cornerstone* 255.025	Udairi Twr 321.5			89	10	
G		AC-1 297.850°U 256.850°D	LOC/DME 108.9/26X	KCIA App 274.6	KCIA App 121.3		113	06E	
H	Low Lvl CTAF 137.850	JSOTF 296.125°U 262.525°D	VORTAC 116/107X	KCIA Twr 253.2	KCIA Twr 118.3				

Time	Line #	Event	Word
1445Z		LOAD	
1450Z		COMM CHECK	
1530Z		TAKEOFF AS	
1540Z		INFIL COMPLETE	
1553Z		LAND AS	
1630Z		TAKEOFF AS #2	
1640Z		EXFIL COMPLETE	
1700Z		LAND AS #2	
1915		LOAD	
2000		T/O	
2010		INFILL	
2023		LAND	
2102		T/O	

Mission Dat		
Team C/S	Demon	Virus
	BLUE	OPV

TANKER	FREQUENCIES PRI	ALT	TRACK	OPTION	ARCT

AA-3

1 2 3 4 7

T/O TIME: 15:29:40
LDG TIME: 17:00:00
TOTAL ETE: 01+30+20
TOTAL DIST: 76.2

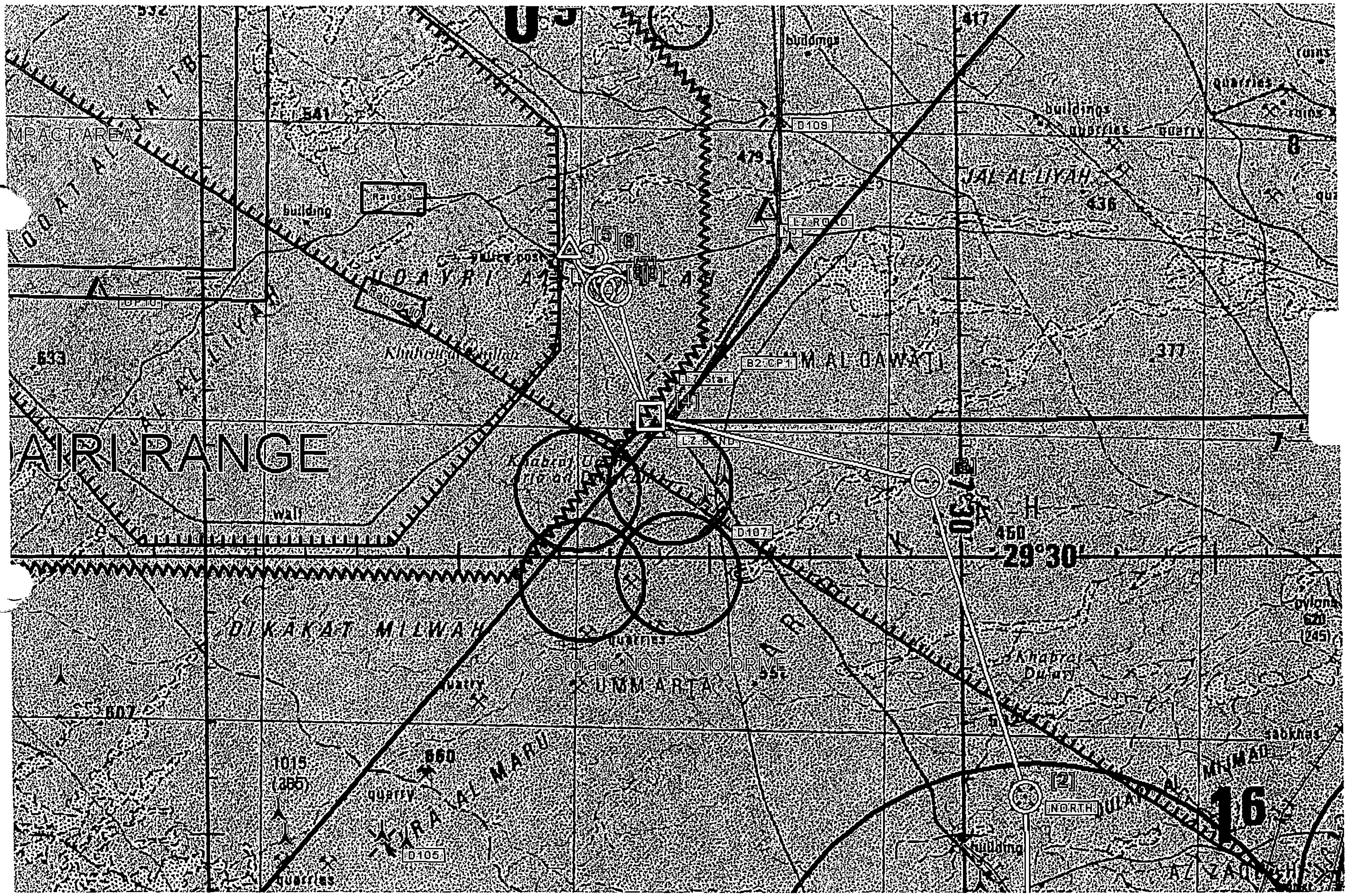
DTG AS OF: 200302122048
DATUM: WGS84

RAMP FUEL: 3800
ONLOAD:
FUEL REQ+RES T/O: 2796
FUEL REMAINING: 1004

DTD	WAYPOINT DESCRIPTION TACAN	LAT LON WPT ELEV	TH VAR MH	ETA ATA	LEG DIST REM DIST	LEG TIME REM TIME	GS FFLOW	LEG FUEL REM FUEL	STORE WT ONLOAD GWT
1 1	OKAS/A ALI AL SALEM	N 29 20.80 E047 31.25 472	120 2.8E 117	15:29:40	0.0 76.2	00+00+00 01+30+20		500 3300	0 0 35300
2 2	NORTH/L North Point	N 29 25.65 E047 31.22 472	360 2.9E 357	15:32:18	4.8 71.4	00+02+38 01+27+42	110 2500	110 3190	0 0 35190
3 3	.BERM	N 29 31.33 E047 29.35 453	344 2.9E 341	15:35:31	5.9 65.5	00+03+13 01+24+29	110 2500	134 3056	0 0 35056
4 4	.IP	N 29 32.53 E047 23.84 463	284 2.9E 281	15:38:13	5.0 60.6	00+02+42 01+21+47	110 2500	113 2943	0 0 34943
5 1	.DOGWOOD none RAKE 13	N 29 35.50 E047 22.27 472	335 2.9E 332	15:40:00	3.3 57.3	00+01+47 01+20+00	110 2500	74 2869	0 0 34869
	.delay	N 29 35.50 E047 22.27 472	335 2.9E 332	15:42:00	0.0 57.3	00+02+00 01+18+00	110 2500	83 2786	0 0 34786
6	.ELM RAKE 14	N 29 35.38 E047 22.70 469	107 0 104	15:42:13	0.4 56.9	00+00+13 01+17+47	110 2500	9 2777	0 0 34777
7	.PINE 2 RAKE 16	N 29 34.96 E047 23.04 482	145 0 145	15:42:30	0.5 56.4	00+00+17 01+17+30	110 2500	12 2765	0 0 34765
8	.PINE 1 RAKE 15	N 29 34.81 E047 22.88 479	225 0 225	15:42:37	0.2 56.2	00+00+07 01+17+23	110 2500	5 2760	0 0 34760
9	.PINE 3	N 29 34.79 E047 23.18 482	096 0 096	15:42:46	0.3 55.9	00+00+09 01+17+14	110 2500	6 2754	0 0 34754
4	.IP	N 29 32.53 E047 23.84 463	166 2.9E 166	15:44:02	2.3 53.6	00+01+16 01+15+58	110 2500	53 2701	0 0 34701
3	.BERM	N 29 31.33 E047 29.35 453	104 2.9E 101	15:46:44	5.0 48.6	00+02+42 01+13+16	110 2500	113 2588	0 0 34588
2	NORTH/L North Point	N 29 25.65 E047 31.22 472	164 2.9E 161	15:49:57	5.9 42.7	00+03+13 01+10+03	110 2500	134 2454	0 0 34454
1	AS/L AL SALEM	N 29 20.80 E047 31.24 453	180 2.9E 177	15:52:35	4.8 37.9	00+02+38 01+07+25	110 2500	110 2344	0 0 34344
	.auto delay	N 29 20.80 E047 31.24 453	180 2.9E 177	16:29:20	0.0 37.9	00+36+45 00+30+40	110 100	61 2283	0 0 34283
2	NORTH/L North Point	N 29 25.65 E047 31.22 472	360 2.9E 357	16:31:58	4.8 33.1	00+02+38 00+28+02	110 2500	110 2173	0 0 34173
3	.BERM	N 29 31.33 E047 29.35	344 2.9E	16:35:11	5.9	00+03+13	110	134	0 0

DTD	WAYPOINT DESCRIPTION TACAN	LAT LON WPT ELEV	TH VAR MH	ETA	LEG DIST REM DIST	LEG TIME REM TIME	GS FFLOW	LEG FUEL REM FUEL	STORE WT ONLOAD GWT
4	.IP	N 29 32.53 E047 23.84 463	284 2.9E 281	16:37:53	5.0 22.2	00+02+42 00+22+07	110 2500	113 1926	0 0 33926
5	.DOGWOOD none	N 29 35.50 E047 22.27 472	335 2.9E 332	16:39:40	3.3 19.0	00+01+47 00+20+20	110 2500	74 1852	0 0 [illegible]852
	.delay	N 29 35.50 E047 22.27 472	335 2.9E 332	16:49:40	0.0 19.0	00+10+00 00+10+20	110 2500	417 1435	[illegible] 334[illegible]
4	.IP	N 29 32.53 E047 23.84 463	155 2.9E 152	16:51:27	3.3 15.7	00+01+47 00+08+33	110 2500	74 1361	0 0 33361
3	.BERM	N 29 31.33 E047 29.35 453	104 2.9E 101	16:54:09	5.0 10.7	00+02+42 00+05+51	110 2500	113 1248	0 0 33248
2	NORTH/L North Point	N 29 25.65 E047 31.22 472	164 2.9E 161	16:57:22	5.9 4.8	00+03+13 00+02+38	110 2500	134 1114	0 0 33114
1	AS/L AL SALEM	N 29 20.80 E047 31.24 453	180 2.9E 177	17:00:00	4.8 0.0	00+02+38 00+00+00	110 2500	110 1004	0 0 33004

ROUTE OVERVIEW



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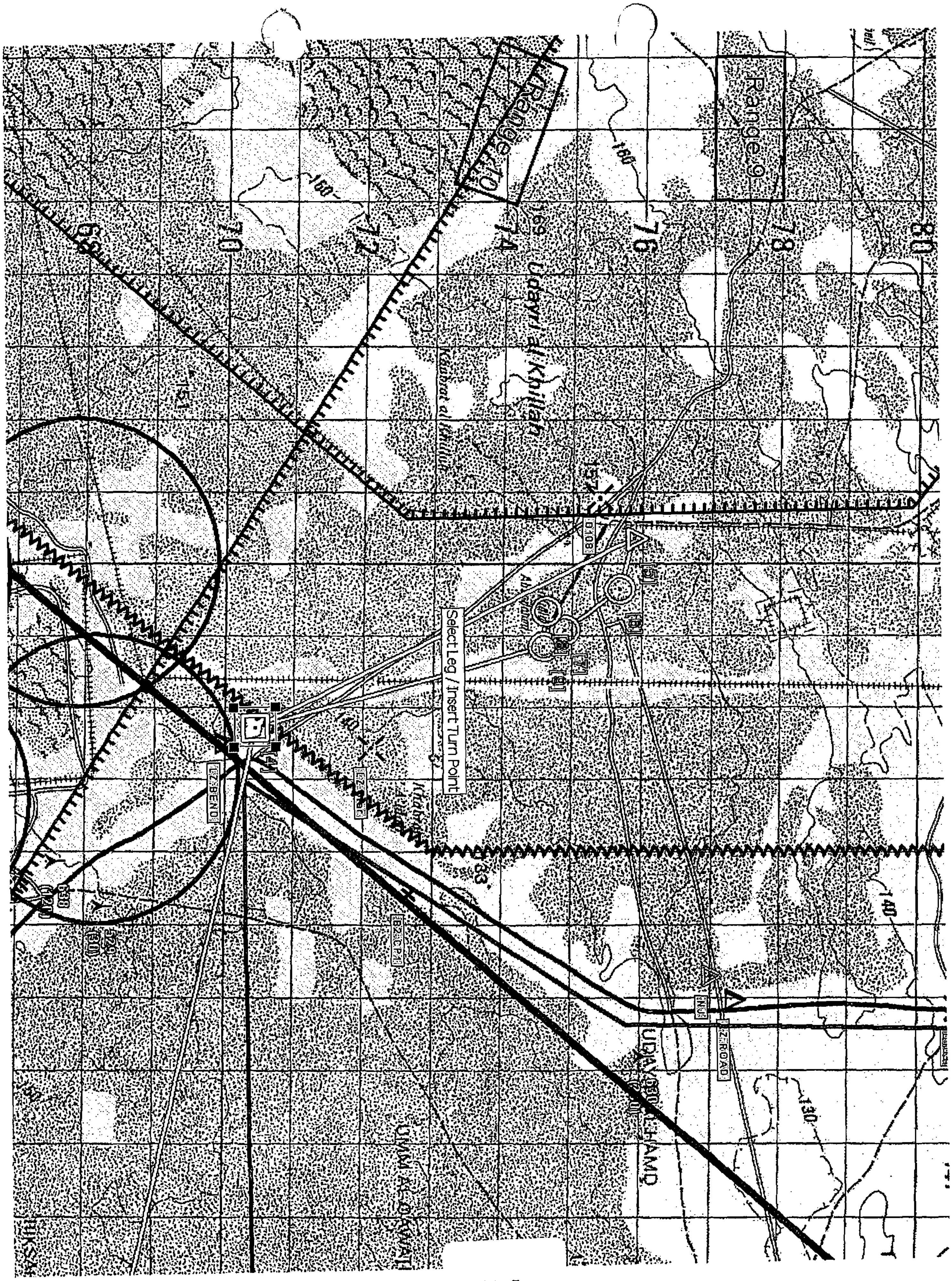
Range 9
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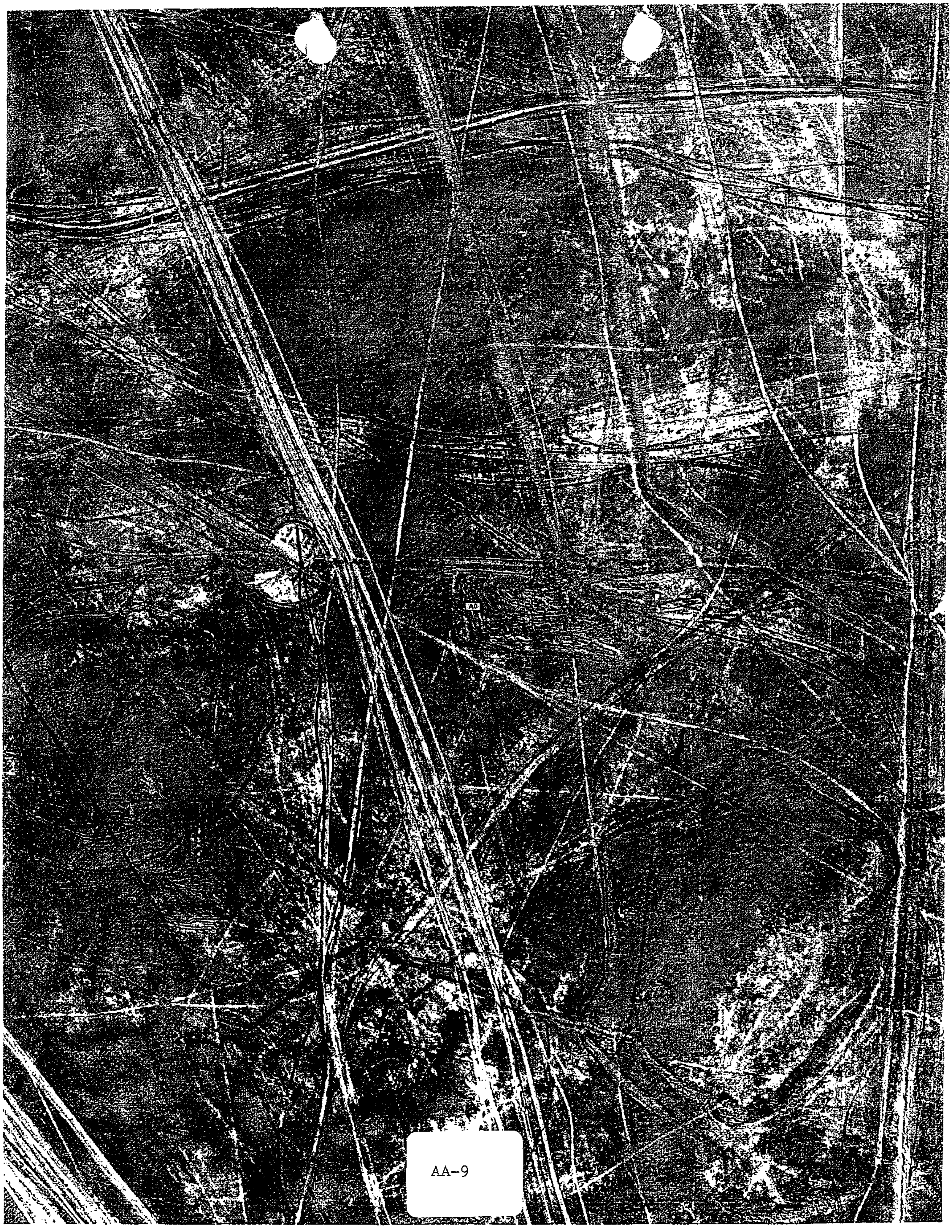
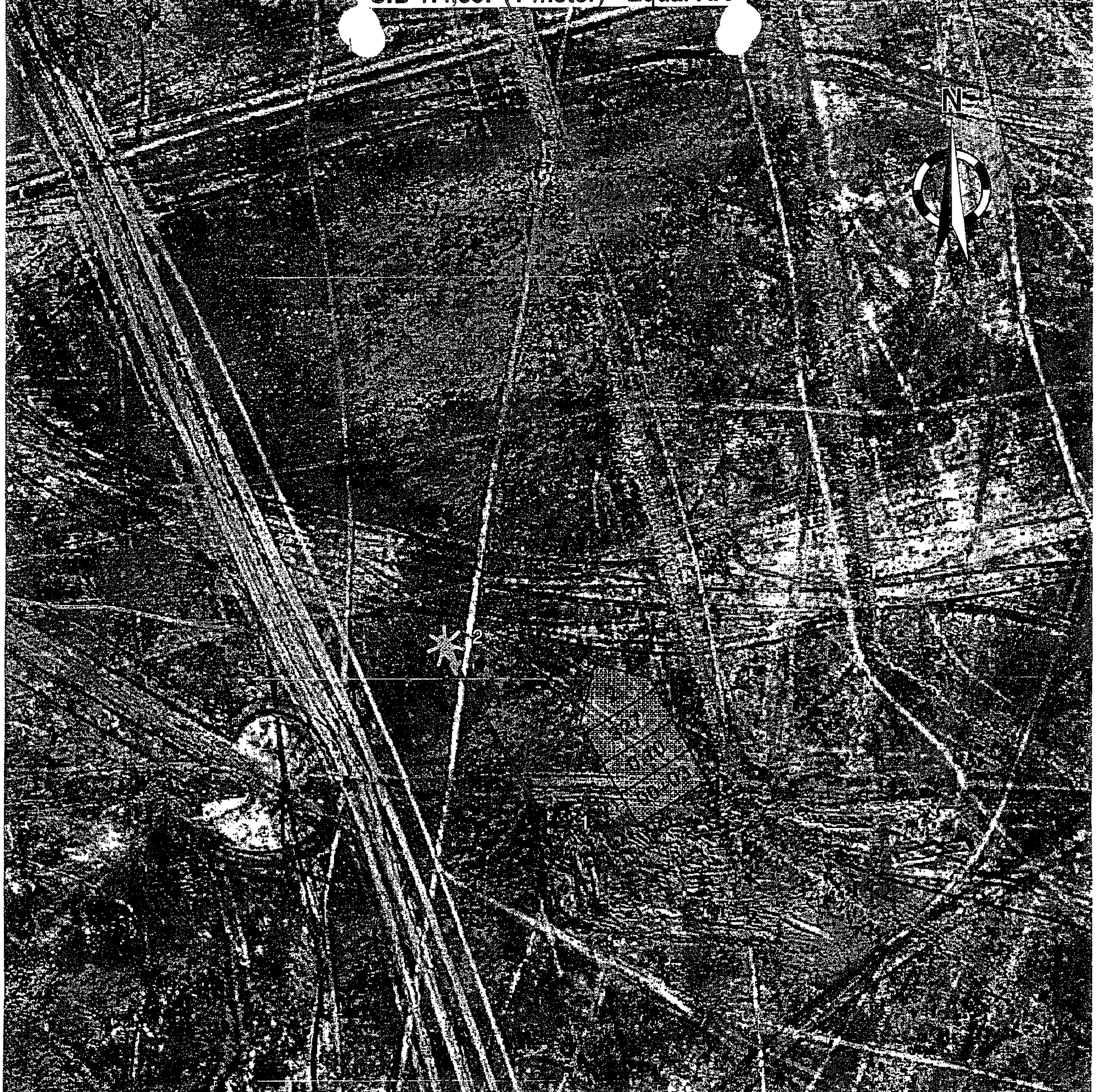


AA-9

CIB 1:4,667 (1 meter) - Equal Arc



T/O TIME: 00:00:00
LDG TIME: 00:00:03
TOTAL ETE: 00+00+03
TOTAL DIST: 0.1

DTG AS OF: 200305051128
DATUM: WGS84

RAMP FUEL: 9000
ONLOAD:
FUEL REQ+RES T/O: 502
FUEL REMAINING: 8498

DTD	WAYPOINT DESCRIPTION TACAN	LAT LON WPT ELEV	TH VAR MH	ETA / ATA	LEG DIST / REM DIST	LEG TIME / REM TIME	GS / FFLOW	LEG FUEL / REM FUEL	STORE WT ONLOAD GWT
		N 29 34.87 E047 23.10 482	053 2.9E 050	00:00:00	0.0 0.1	00+00+00 00+00+03		500 8500	0 0 40500
		N 29 34.96 E047 23.04 482	330 2.9E 327	00:00:03	0.1 0.0	00+00+03 00+00+00	110 2362	2 8498	0 0 40498

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Printed May 05 2003 11:32
DAFIF expired Apr 16 2003

A CRAFT INCIDENT WORKS EET

AUTHORITY. 10 U.S.C 8013, Secre of the Air Force: powers and duties; d ion by; and AFR 127-4/AFSOC Sup 1, Investigating and Reporting US Air Force Mishaps.

PURPOSE. SSN required to positively identify individuals involved in mishap or incident.

ROUTINE USES. None. Disclosure of the SSN is voluntary for the purposes of this worksheet. Alternate means of ID are not necessary. Collecting SSN will make further reporting easier, if reporting is required.

FOR CREW USE

EXERCISE/OPERATION CODE NAME	DATE, LOCAL TIME AND TIME ZONE, DAWN, DAY, DUSK, OR NIGHT	LOCATION OF MISHAP (Coordinates bearing, and distance from nearest military installation)
RAKE 14 WATCH OPERATION SOUTHERN	13 FEB 03/2330/ U-3 /NIGHT	CL

TYPE AIRCRAFT, MODEL, & SERIAL NUMBER (For air refueling mishaps, include type, model and serial number or second aircraft)	CHAIN OF COMMAND FOR ORGANIZATION POSSESSING AIRCRAFT (Show same for crew if different from aircraft)
MH-53M 68-10930	20 SOS / 16 SOW / AFSOC

DAMAGE (Describe all damage to AF and non-AF property and equipment)

NOSE GEAR, RT ENG BAPS, UPPER COWLING AREA, ALL MAIN AND TAIL ROTOR BLADES, TAIL PYLON DEPARTED A/C. RIGHT GULL-WING DEPARTED

PERSONNEL INVOLVED (Include name, grade, SSN, AFSC, age, assigned duty, phone number, and a description of any injury or illness)

WOODWORTH, SHANNON J CAPT/41/ 11S3A/ / R SHOULDER - BRUISES
REECE, BRIAN L., CPT, 27, ~~[illegible]~~, 11S3A, RT LEG / LEFT SHOULDER ELBOW
KERWOOD, WILLIAM J. TSGT, 1A1X1B, 36, BRUISED RIBS
BOWLING, ~~BRIAN~~ JAMES B. SSGT 1A1X1B, 30, --- RT ELBOW
PHILLIPS ALVIN Q 1A771, 40 None
MARESH, ANDREW 1A751, 27 Mult Contusions Abrasions

WEATHER (At time of occurrence, temperature and meteorological conditions)

VIS 7 2 MILES IN HAZE / 19°C / WINDS NE 4-6 KTS

TAKE OFF TIME (local) AND DURATION OF FLIGHT	ALTITUDE AT TIME OF OCCURENCE (If below 10,000 feet, show MSL / AGL)
2000 Z	GROUND

GROSS WEIGHT AND FUEL ON BOARD FOR TAKE OFF AND LANDING MISHAPS	LIFE SUPPORT EQUIPMENT USED
44,600K LANDING (W 2400# FUEL)	NONE

NARRATIVE (A concise, chronological description of the facts and circumstances leading to the occurrence, actions, and results)

AIRCRAFT ~~CONNECTED~~ CONTACTED GROUND WITH NOSE GEAR COLLAPSE AND MAIN ROTOR BLADE CONTACT WITH GROUND. TAIL ROTOR PYLON BROKE OFF VIC AFT AVIONICS RACK.

CAPT USAF 14 FEB 03

CONTINUE ON REVERSE

AFSOC Form 87, NOV 90 (LRA)

FC: 4900, PD: AFR 127-4/AFSOC Sup 1

FOR OFF LY (When filled In)

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GOVERNMENT DOCUMENTS AND REGULATIONS

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BY THE ORDER OF
THE SECRETARY OF THE AIR FORCE

AF INSTRUCTION 11-2MH-53 VOLUME 1
11 JULY 2001

Flying Operations

MH-53 AIRCREW TRAINING

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

NOTICE: This publication is available digitally on the AFDPO WWW site at: **http://afpubs.hq.af.mil.**

OPR: HQ AFSOC/DOT (Maj Jon Owens)

Certified by: HQ USAF/XOO (Maj Gen Walter E. Buchanan III)

Supersedes AFI 11-2MH-53, Vol 1, 6 July 1999

Pages: 75
Distribution: F

This instruction implements AFPD 11-2, *Aircraft Rules and Procedures*, and AFPD 11-4, *Aviation Service.* Along with AFI 11-202, Vol 1, *Aircrew Training*, this volume establishes MDS-specific standards for qualification, mission qualification, upgrade, and continuation training for aircrew members operating US Air Force MH-53 helicopters. This instruction is not applicable to the Air National Guard or Air Force Reserve Command. The policies and guidance of this instruction apply to US Air Force MH-53 helicopter operations as well as US Air Force TH-53A operations. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

The Privacy Act of 1974 affects this instruction. The Privacy Act System Number F011 AF XO A, Air Force Operations Resource Management Systems (AFORMS) covers required information. The authority for maintenance of the system is 37 U.S.C. 301a (Incentive Pay), Public Law 92-204, Section 715 (Appropriations Act for 1973), Public Law 93-570 (Appropriations Act for 1974), Public Law 93-294 (Aviation Career Incentive Act of 1974), DoDD 7730.57 (Aviation Career Incentive Act and Required Annual Report, February 5, 1976, with Changes 1 and 2), and Executive Order 9397.

The Paperwork Reduction Act of 1974 as amended in 1996 affects this instruction. Also, the Air Force Forms Management Program IAW AFI 37-160V8, *The Air Force Publications and Forms Management Program - Developing and Processing Forms*, affects this instruction.

This instruction contains references to the following field (subordinate level) publications and forms which, until converted to departmental level publications and forms, may be obtained from the respective MAJCOM publication office.

Publications: AFSOCI 11-301, AFSOCR 55-12, PACAFI 11-201, and USAFEI 11-201.

Forms: AF Forms 4109, 4110, 4111

1.7.3. Senior Officer Multiple Aircraft Qualifications. Senior officers in supervisory flying positions (RPI 6 or 8) maintaining multiple aircraft qualifications must have completed applicable formal UPT/ UHT courses. Basic qualification requires qualification examinations in each aircraft and qualification flight evaluations in each MDS aircraft. Mission qualification requires mission qualification examinations and mission flight evaluations in each MDS aircraft. Comply with all continuation requirements for Multiple Aircraft Qualifications in **Chapter 4**.

1.8. Transfer of Aircrew Members . For intra- and inter-command transfer of aircrews, the gaining organization will honor validated training completed prior to the transfer to determine the appropriate training phase for newly assigned crewmembers. Aircrew personnel qualified in the same MDS of one USAF unit are considered qualified in that equipment throughout the force, when used for the same mission. For inter-command transfer, qualifications may be accepted at the discretion of the gaining unit commander. In this case, the gaining unit commander will determine training required for newly assigned personnel.

1.9. Permanent Change of Station (PCS) Screening .

1.9.1. Units will ensure individual flight and ground training records are screened during unit out-processing. This screening will be accomplished in sufficient time to ensure discrepancies are corrected prior to PCS. Additionally, personnel departing to short tour areas will be scheduled by the losing organization for simulator, altitude chamber, and other training events as appropriate, to prevent unnecessary TDY away from the assigned short tour area. Losing unit will provide a printed copy of current ground and flying training summaries to individuals prior to PCS.

1.10. Unit Aircrew Capability . Primary crewmembers up to unit crew authorizations will maintain MR/CMR status (N/A for 58 SOW aircrew members.) Commanders will ensure aircrews are trained to meet unit capability requirements. Crewmembers assigned above unit manning levels, or surplus to unit authorizations, will maintain MR, BMC, or BAQ status, as directed by the unit commander. **Attachment 2** lists aircrew events and capabilities for mission, special mission, and instructor certifications.

NOTE: To change from BMC to MR status, aircrew will begin maintaining full MR flying currency.

1.10.1. 58 SOW Currency Requirements. Permanent Party aircrew assigned to the 58 SOW must maintain at least basic mission capable flying currency in the portions of the mission they will instruct. They must maintain continuation training currency with the exceptions indicated in **Chapter 4** of this instruction. Squadron commanders may direct specific individuals to maintain only BAQ or partial BMC qualifications. In such cases, individual currency will require only those items associated with the directed qualification levels. The individual's AF Form 8 will indicate restrictions associated with other than full mission qualification. 58 SOW aircrew are not considered BMC or MR by AFSOC standards unless they maintain all AFSOC required flight and ground training currency, in accordance with this instruction. If 58 SOW crewmembers augment AFSOC, the gaining squadron commander and HQ AFSOC/DOT must be informed of any augmentee's lack of training below full MR qualification. HQ AFSOC/DOT, HQ AETC/DOFS, and the 58 SOW will coordinate for additional training or currency waivers as required.

1.11. Unit/Theater Indoctrination Program .

1.11.1. Prior to performing unsupervised aircrew duties, crewmembers will complete a unit/theater indoctrination program. This training is a requirement for all newly assigned or temporary duty (TDY) aircrew members. Units will publish directives outlining specific ground and flight training requirements. Design training to prepare crewmembers for the specific theater of operations. This training will: familiarize crewmembers with the local flying area, facilities and support agencies available; introduce any theater/mission-unique procedures; and review all theater-unique instrument flying requirements. The instrument training portion will include, at a minimum, theater-unique instrument requirements and procedures, the use of MAJCOM-approved non-DOD instrument approach procedures, required instrumentation for specific approaches, and general theater weather conditions. Document unit/theater indoctrination training in AFORMS for all assigned and attached personnel. The unit commander or a designated representative must approve all unit/theater indoctrination training flights conducted at night.

1.11.2. As part of the local area procedure orientation, recent formal school pilot and flight engineer (P and FE) graduates should receive a random sample of emergency procedures and an instrument approach (P) during the unit indoctrination flight.

1.11.3. Because the 58 SOW only introduces day water operations, additional day water operations training may be required for first assignment crewmembers.

1.11.4. The following personnel are exempt from the above requirements: MAJCOM headquarters standardization and evaluation personnel administering flight evaluations and personnel returning to a previously assigned unit following a short tour assignment. However, any changes to local flying procedures must be briefed in detail.

1.12. Initial Cadre for Change of Unit Aircraft, Equipment, or Capability .

1.12.1. When possible, qualified personnel from units operating like equipment will provide the initial cadre. In some instances, it may be necessary for units converting from one design aircraft to another to form an initial cadre of aircrew personnel for whom certain training qualification requirements may be waived. Authorization to form initial cadre crews will be contained in the conversion program action directive. Unless otherwise stated in the program action directive, the following conditions will apply to management of initial cadre aircrew qualification.

1.12.1.1. A nucleus of instructor and flight examiner personnel (initial cadre) will be formed to begin aircrew conversion. Converting units send proposed initial cadre list by name, rank, current crew position and aircraft, total flying time, and requested crew qualification level through channels to MAJCOM/DO for approval.

1.12.1.2. Initial cadre will not be designated in a crew position higher than that currently held, i.e. - H-53 aircraft commander to CV-22 flight examiner. Enter appropriate comments in the remarks section of the AF Form 8 or AF Form 1381, explaining the individual's status as initial cadre instructor or flight examiner.

1.12.1.3. Following final approval, each converting unit will publish a letter identifying initial cadre instructors and flight examiners by aircraft and crew qualification. A copy of this letter will be kept on file in each individual's Flight Evaluation Folder.

1.13. Multiple Aircraft Qualifications.

Attachment 5

FLYING TRAINING REQUIREMENTS

Table A5.1. Semiannual Basic Qualification Flying Training Requirements.

SEMIANNUAL BASIC QUALIFICATION (VOLUME) FLYING TRAINING REQUIREMENTS						
REQUIREMENT (NOTES)	**[AFORMS ID]**	**P**	**FE**	**AG**	**FS**	**DSO**
SORTIES	[B010]	18	12	12	6*	6
NIGHT SORTIES	[B011]	2	2	2	1	1
EMERGENCY PROCEDURES SORTIES	[B200]	2	2			
TRANSITION SORTIES	[B210]	2				
EMERGENCY PROCEDURE EVENT	[B200]	3				
HOLDING PATTERN	[B060]	2				
PRECISION APPROACH	[B080]	6				
NON-PRECISION APPROACH	[B100]	6				
CIRCLING APPROACH	[B115]	2				
MISSED APPROACH	[B110]	2				

* Flight Surgeons will log 50 percent of flying training volume requirements in primary aircraft.

Table A5.2. Basic, Mission, Special Mission Qualification Frequency Requirements.

FREQUENCY (CURRENCY) REQUIREMENTS: BASIC, MISSION, SPECIAL MISSION NUMBER/TIME PERIOD (DAYS)			
EVENTS (NOTES) [AFORMS ID]	**PILOT FREQUENCY**	**FE FREQUENCY**	**AG FREQUENCY**
SORTIE [B010]	1/45	1/60	1/60
NVG SORTIE [NV06]	1/60	1/60	1/60
INSTRUMENT APPROACH [B070]	1/45	N/A	N/A
PAVE LOW NIGHT MOUNTAN [NM01]	1/120	1/120	N/A
SHIPBOARD OPERATIONS - MULTIPLE SPOT (Notes 4, 8) [SO02]	1/270	N/A	N/A
SHIPBOARD OPERATIONS – SINGLE SPOT (Notes 4, 8) [SO01]	1/180	N/A	N/A
CARGO SLING [CS01]	1/BIENNIAL	1/BIENNIAL	N/A

Table A5.3. Mission Qualification Semiannual/Quarterly Flying Training Requirements.

MISSION QUALIFICATION (VOLUME) SEMIANNUAL/QUARTERLY FLYING REQUIREMENTS						
REQUIREMENT	**PILOT**		**FE**		**AG**	
EVENT NAME (NOTES) [AFORMS ID]	**SA**	**QTR**	**SA**	**QTR**	**SA**	**QTR**
AIR REFUELING [AR20]	2		1		1	
NVG AIR REFUELING [AR21]	1		1		1	
ALTERNATE INSERTION/EXTRACTION (Note 2) [IS01]	4					
FAST ROPE [IS02]				1		1
ROPE LADDER [IS03]				1		1
HOIST [IS05]				1		
RAPPEL [IS04]				1		1
SWIMMER DEPLOYMENT [IS07]			1		1	
SPIE/STABO [IS06]			1			
CRRC/SOFT DUCK [IS08]					1	
COMBAT MISSION PROFILE (Note 5) [CT03]	4		4		4	
IDAS/MATT PROFILE (Note 6) [IM01]	2		2			

MISSION QUALIFICATION (VOLUME) SEMIANNUAL/QUARTERLY FLYING REQUIREMENTS						
REQUIREMENT	**PILOT**		**FE**		**AG**	
DAY WATER OPERATIONS (Note 3) [S420]	1		1		1	
EXPENDABLE EVENT (Note 8) [EW04]	1		1		1	
GROUND RADAR EVENT [EW02]	1		1			
HOT REFUELING/FARP [HR01]	1		1		1	
NVG FORMATION [F108]	3		3		3	
TACTICAL GUNNERY (Note 1) [TG01]				3		3
NVG TACTICAL GUNNERY (Note 1) [TG02]				2		2
.50 CALIBER MACHINE GUN (Note 1) [TG04]			1		1	
MINI-GUN (Note 1) [TG03]			1		1	
PAVE LOW COUPLED APPROACH [CA01]		2		2		
CHEMICAL DEFENSE TASK QUALIFICATION TRAINING [LS17]	1		1		1	
PAVE LOW NIGHT MOUNTAIN [NM01]	3		3			
PAVE LOW NIGHT WATER OPERATIONS (Note 8) [WO02]		1	2		2	
SHIPBOARD OPERATIONS (Note 4, 8) [SO04]			1		1	
PROFICIENCY SORTIE (Note 7) [B020]	2		2		2	

NOTES:

(Apply to **Table A5.1.**, **Table A5.2.**, and **Table A5.3.**)

1. Two of the three per quarter tactical gunnery missions must be flown on NVGs; one may be flown during the day. One gunnery mission may be credited while firing blanks. For units possessing more than one gun system, currency will include firing each weapon semiannually.
2. FE and AG must accomplish, as a minimum, at least one of each event in which qualified (fastrope, rope ladder, rappel, hoist, SPIE/STABO, swimmer deployment, CRRC/soft duck).

3. Required only if not PAVE LOW Water Operations qualified.
4. See Joint Pub 3-04.1.
5. DSOs will log six combat mission profiles each semiannual period. Missions flown on any combination of AFSOC aircraft in which the operator is qualified fulfill this requirement. To ensure multi-qualified DSOs maintain currency in each aircraft qualified, they will log at least one combat mission profile, as primary DSO, in each MDS aircraft during the semiannual period.
6. Dual Crediting of Currency. Items listed in tables that appear indented, dual credit the non-indented item preceding them. NVG Sortie credits both night sortie and sortie requirements. Precision approach and non-precision approach credit 45-day instrument approach requirements. IDAS/MATT profiles credit combat mission profiles for appropriately qualified crews. Individual AIE events credit total AIE requirements.
7. Applies to 58 SOW formal school instructors only.
8. Does not apply to 58 SOW formal school instructors.
9. DSOs will accomplish CDTQT 1/180 days.

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BY ORDER OF THE SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 11-2MH-53
VOLUME 3
3 MAY 2001

Flying Operations

MH-53 OPERATIONS PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

NOTICE: This publication is available digitally on the AFDPO WWW site at: **http://afpubs.hq.af.mil.**

OPR: HQ AFSOC/DOVR (Capt Shawn G Silverman)
Supersedes AFI 11-2MH-53 Volume 3, 1 November 1998

Certified by: HQ USAF/XOO (Maj Gen Walter E. Buchanan III)
Pages: 64
Distribution: F

This instruction implements AFPD 11-2, *Flight Rules and Procedures*. It establishes procedures for the operation of TH/MH-53 helicopters employed by AFSOC and AETC to accomplish their worldwide operational and training missions. Unless noted otherwise, instructions contained herein apply to TH/MH-53A/J/M helicopters. It provides the most acceptable policies and procedures for most circumstances, but does not replace sound judgment. This instruction does not apply to the Air National Guard or Air Force Reserve Command. The Paperwork Reduction Act of 1974 as amended in 1996 affects this instruction. Maintain and dispose of all records created as a result of prescribed processes in this instruction in accordance with AFMAN, 37-139, *Records Disposition Schedule*.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

The tactics, techniques and procedures have been removed from this regulation and placed in AFTTP 3-1 Vol 34. Changes include, but are not limited to, the following. Procedures for Direct Support Operators have been added. Cover ship requirements have been changed. Security and reporting procedures have been updated. IMC TF/TA regulations have been added. Alert procedures have been altered. The following forms are referenced in this regulation AFTO Form 46 **Prepositioned Life Support Equipment**, AFTO 781 **Aircrew/Mission Flight Data Document**, AF Form 847 **Recommendation for Change of Publication**, AF Form 15 **USAF Invoice**, AF Form 315, **USAF Aviation Fuels Invoice**, AF Form 651 **Hazardous Air Traffic Report (HATR),** AF Form 711 **USAF Mishap Report,** DD Form 96 or DD form 2131 **Passenger Manifest**, DD Form 175 **Military Flight Plan**, DD Form 365 **Weight and Balance**, DD Form 1801 DOD **International Flight Plan.**

5.5.2. Pilots will make advisory calls to the crew prior to beginning the evasive maneuver. Crewmembers will clear the aircraft of obstacles throughout the maneuvering.

5.6. Power Required for Terminal Operations Training:

5.6.1. Clear escape route: Hover power plus 5 percent

5.6.2. Restricted escape route: Out of ground effect (OGE) hover power plus 5 percent.

5.7. Landing Zones.

5.7.1. The HLZ Survey program is a tactics function. Unit stan tactics must ensure that surveys are conducted and updated IAW the procedures below. It is the responsibility of all aircrew or ground personnel to notify the POC for the unit HLZ survey program, in timely manner, of any changes or discrepancies on existing HLZ surveys in a timely manner.

5.7.2. In all cases, except operational or contingency missions, HLZs (Landing or AIE) require a documented landing zone survey. HLZ surveys will be conducted during daylight by a qualified STS member or an instructor qualified aircrew member (IP, IF, or IG). If these personnel are not available and/or a landing zone survey can't be accomplished, the squadron commander or COMAFSOF may approve the temporary use of the following methods. If the following methods are used, the currency of the materials must be considered and aircrew should use extreme caution while operating at higher risk.

5.7.2.1. Imagery.

5.7.2.2. 1:50,000 scale map or less.

5.7.2.3. Squadron Commander/COMAFSOF approved personnel that do not meet the above requirements.

5.7.2.4. Squadron Commander/COMAFSOF may approve the use of other MAJCOM equivalent HLZ surveys.

5.7.3. All HLZ surveys will be updated every six months. HLZs that are not updated in the six months time period will be closed until resurveyed using the above criteria (does not require a new landing zone survey). The absolute minimum to update a HLZ survey requires a qualified STS member or an instructor qualified aircrew member (IP, IF or IG) to resurvey the HLZ during daylight. This member must evaluate items 7, 8 and 9 of the landing zone survey. If an HLZ survey has gone more than a year without an update it is considered expired and a new landing zone survey will be accomplished IAW AFI 13-217 and the AFSOC supplement. The squadron commander may extend the currency of a HLZ survey up to two months past it's update period.

5.7.4. A thorough review of the landing zone survey and accompanying photography/imagery will be accomplished by all crewmembers during the aircrew brief. The aircraft commander is responsible for ensuring that any crewmember unable to attend the brief either reviews the landing zone survey or is briefed on hazards associated with the HLZs.

5.8. Live-Hoist Training. Restrict live hoist training to the minimum necessary to accomplish initial qualification, re-qualification, and proficiency training. Squadron commanders determine eligibility of personnel to ride the hoist during training. Altitude is the minimum required to accomplish the mission. Hoist training over trees should be conducted at sites that are adjacent to a suitable emergency landing uty for Engineering (ASC/ENAE) certifying the device is approved for airborne use. If the aircrew detects any interference from an electronic device used aboard the aircraft, discontinue the use of this device for the duration of the flight.

6.17. Illumination Requirements:

6.17.1. Fully operational (FLIR and Radar) MH-53 aircraft have no enroute illumination restrictions.

6.17.2. Do not fly with mixed ANVIS and F4949 NVGs on a crew. Exception: 58 SOW aircrews may mix F4949 and ANVIS NVG's on a crew, however, pilots must wear the same type of NVG's.

6.17.3. Flights conducted in an aircraft without a FLIR and/or Radar require 5% equivalent moon illumination (starlight is considered 8% EMI). The decision on whether sufficient illumination exists to complete the mission rest with the PIC or Flight Lead.

WARNING: NVG's worn in black-hole conditions can exacerbate induced motion illusions and lead to spatial disorientation.

6.18. Altitude Restrictions. Conduct all operations at or above 300 feet AGL except when lower altitudes are required for takeoff, landing, operational missions, training flights in approved areas or routes, or approved exercise missions.

6.18.1. Minimum enroute altitude for unaided (no NVG and no Pave Low system) night navigation, both operationally and for training, is 500 feet above the highest obstacle within 5NM.

6.18.2. NVGs and PAVE LOW system are the only approved methods for conducting night operations below 300 feet. Helicopters are limited to a base altitude of 50 feet above obstacles during day or night low-level tactical operations. Normal NVG overwater cruise flight is limited to 100' AWL base altitude. If required due to the tactical situation (METT-T), aircrew training/proficiency and night water operations, NVG overwater cruise is permitted down to a base altitude of 50' AWL. Time spent at the minimum altitude should be the minimum required to defeat the threat or complete tactical proficiency training and night water operations.

6.18.3. When sufficient illumination is not available to conduct NVG low-level operations or when flying over a non-surveyed area, conduct flights at a minimum altitude of 300 feet above the highest obstacle along the flight path in non-mountainous areas (500 in mountainous areas).

NOTE: Mountainous areas are defined as having a 500 foot change in surface altitude over ½ NM.

6.19. Minimum Safe Altitudes. Pilots must compute a minimum safe altitude for each leg of a low-level route. For flights conducted in a designated low-level area, a minimum safe altitude may be computed for the planned area of operation. The heading and altitude must provide a minimum of 1000 feet (2000 feet in mountainous areas) above obstacles within 5 NM of the course.

6.20. Weight and Balance. A new or corrected DD Form 365-4, **Weight and Balance Clearance Form F-Transport**, need not be recomputed provided the initial takeoff gross weight (item 16) is not changed by more than 500 lbs. The flight engineer will compute inflight crew and passenger equipment movement to ensure CG limits are not exceeded. These computations will address the maximum number of personnel and equipment that can be in a specific compartment without exceeding CG limits. This procedure applies to all operations in which CG limits may be exceeded as a result of personnel and equipment movement. Although no written adjustments are required, the flight engineer will compute these changes

Chapter 7

MISSION PREPARATION

7.1. Flight Planning Systems. The primary flight/mission planning system is the Special Operations Forces Planning and Rehearsal System (SOFPARS). SOFPARS is a subset of the Air Force Mission Support System (AFMSS) which includes the Portable Flight Planning Software (PFPS). Upgraded or new versions of SOFPARS will be released and authorized by the AFSOC/DO for use after applicable testing has been completed (OPR: HQ AFSOC/DOXC)

7.1.1. Electronic Data Transfer. If the flight planning computer transfers a flight plan to the aircraft electronically, it must be an AFSOC approved system. HQ AFSOC/DOXC will periodically publish a listing of approved systems. Aircrews will not use unapproved versions of any system to load an aircraft navigation computer without HQ AFSOC/DOXC approval

7.2. Approval of Exercise Training Areas and Low Level Navigation Areas. Geographical areas, such as range complexes, may be designated as exercise or low-level navigation areas. Ideally, low-level navigation routes, if utilized, should feed into exercise areas.

7.2.1. Surveys. Prior to any operations below 300 feet AGL, accomplish a survey of the route or area as follows:

7.2.1.1. Make an extensive map study of the selected routes and areas. Annotate all man-made obstacles over 50 feet AGL (or the lowest altitude to be flown) , except when below the tree line. Additionally, annotate any published low-level routes, no-fly areas, animal farms or other hazards within the boundaries. Use the Chart Updating Manual (CHUM) or host nation procedures to ensure current obstacles are depicted on maps.

7.2.1.2. For navigation legs below 300 feet AGL, a highly experienced pilot selected by the unit commander or mission commander will fly the survey. The pilot will conduct a parallel search of the proposed route or area at the lowest applicable altitude down to a minimum altitude of 50 feet AGL. Check the obstacle location against map location and any additional obstacles charted.

7.2.1.3. Flight surveys are not required provided the exercise area is within a designated range complex and the host provides specific information (description, location, height MSL and AGL) for all man-made obstacles over 50 feet AGL or the lowest altitude to be flown.

7.2.1.4. Route or area surveys conducted by other participating aircraft may be used provided the survey information is available and flight operations are conducted no lower than the survey altitude.

7.2.1.5. If a route or area has been inactive or flight operations have not been conducted at survey minimums for 6 months, re-accomplish the survey or restrict operations to or above the lowest level flown during the 6-month period.

7.3. Master Low-level hazards map. Each unit must have a Master low-level hazards map depicting hazards to low-flying aircraft for the local areas and areas of frequent operation. Plot them on a suitable chart and display them in the crew briefing area. Make changes as received and bring them to the attention of all crewmembers. Review the chart monthly. The reviewer should annotate the chart with their name and the date. Include an appropriate legend for the hazards. Update master maps monthly using the

CHUM supplement (or host nation equivalent). Annotate the date of the update on the master map. When uncharted obstacles are found, record appropriate information (location, approximate height AGL and MSL). Pilots in command will ensure this information is immediately posted on the master hazards map.

7.4. **Coordinates.** The following procedures will be used:

7.4.1. When reporting or receiving positions using coordinates derived from maps, charts, or related cartographic products, a complete reference to the source of the coordinates will be provided. This reference will include the datum map or chart producer, series, sheet number, edition and date.

7.4.2. When reporting or receiving positions using coordinates derived from non-cartographic sources such as GPS receivers, Analytical Photogrammetric Positioning Systems (APPS), or related systems, a complete reference to the source of the coordinates will be provided. This reference will include the datum, method used to derive the coordinates, agency producing the coordinates, and accuracy of the coordinates.

NOTE: Aircrew will confirm a common datum to their customers during the mission planning process. Failure to plan navigation/LZ's using a common datum may result in errors of up to several miles

7.5. **Flight Logs.** Prepare a MAJCOM approved flight log for each tactical mission and include the following as a minimum: turn points, headings, distances, ETEs, MSAs, and fuel computations. A flight log is not required if the above information is included on the map.

7.6. **Mission Kits.** Mission Kits will be on-board the aircraft for all missions (exception: local area maintenance check flights where an aircraft flight manual is on board). Mission and Navigation kits weighing less than 200 lbs. may be secured with seat belts. Units may supplement kits. The following items will be included:

7.6.1. Aircraft Flight Manual (-1) (may be carried by a designated crewmember).

7.6.2. Air Refueling Manual (-20) (may be carried by a designated crewmember).

7.6.3. AFI 11-202, Volume 3, *General Flight Rules*. (may be carried by a designated crewmember).

7.6.4. AFI 23-202, *Emergency Procurement of Ground Fuels, Oil, and Other Supplies and Services at Non-DOD Locations.*

7.6.5. AFI 23-202, *Refueling at Other Than USAF Bases.*

7.6.6. AFI 11-2MH-53 Volume 3, *MH-53 Operations Procedures*. (may be carried by a designated crewmember).

7.6.7. AF Form 15, **USAF Invoice.**

7.6.8. AF Form 315, **USAF Aviation Fuels Invoice.**

7.6.9. AF Form 457, **USAF Hazard Report.**

7.6.10. AF Form 651, **Hazardous Air Traffic Report (HATR).**

7.6.11. AF Form 711, **USAF Mishap Report.**

7.6.12. Current Flight Crew Information Summary.

7.6.13. DOD FLIP IFR Supplement (one each).

7.6.14. DOD FLIP VFR Supplement (one each).

7.6.15. DOD FLIP Flight Information Handbook (one each).

7.6.16. DOD FLIP Enroute Low Altitude Charts (one set for area of operation).

7.6.17. DOD FLIP Low Altitude Instrument Approach Procedures (two sets for area of operation).

7.6.18. Maps and Charts (sectional aeronautical charts as required).

7.7. Weather Planning:

NOTE: Groups may establish minimum weather criteria (ceiling or visibility) less than day minimums for flights during which only hovering maneuvers will be performed (e.g., hover checks, FCFs).

7.7.1. Training Weather Minimums:

7.7.1.1. VFR Minimums:

7.7.1.1.1. Comply with FAA/ICAO weather minima unless local or theater specific weather minima is more restrictive. In the absence of more restrictive criteria, the following minimum weather criteria (ceiling/visibility) apply during all VFR training operations:

7.7.1.1.1.1. Day: 500/2 SM or 700/1

7.7.1.1.1.2. Night:

7.7.1.1.1.2.1. 1000/2 SM: Unaided.

7.7.1.1.1.2.2. 500/2 SM: ANVIS/ITT 4949 NVGs/PAVE LOW.

7.7.1.2. IFR Minimums. Comply with AFI 11-202 Volume 3

7.7.2. Operational Minimums:

7.7.2.1. VFR Minimums. IAW training VFR minima unless Group CC/COMAFSOF establishes lower minimums.

7.7.2.2. IFR Minimums. IAW AFI 11-202 Volume 3 unless Group CC/COMAFSOF develops and MAJCOM/DO approves Self Contained Departure (SCD), enroute, and Self Contained Approach (SCA) procedures as well as weather minimums which ensure takeoffs, enroute operations and landings can be safely accomplished.

7.8. Hover Coupler Operations. Aircrew will not plan to terminate an IMC arrival (instrument approach or SCA) utilizing the hover coupler.

7.9. Adverse Weather Planning. Flight may be made into areas of known or forecast thunderstorms if VMC is maintained and thunderstorm activity is avoided by a minimum of 5 NM.

7.10. Fuel Planning:

7.10.1. For flight planning purposes, when visibility-only criterion is used, or if destination weather information may be unreliable, fuel requirements for descent, approach, and missed-approach will be 900 pounds. Additionally, for all flights VFR or IFR, plan to arrive at destination with a fuel reserve of 900 pounds.

7.11. Route Planning:

7.11.1. Meet objective TOT's within 30 seconds.

7.11.2. Map Selection. Maps with a scale of 1:250,000 or greater detail are required for low-level operations.

7.12. Map Preparation. Annotate enemy threats and turning or checkpoints on the map. (This information may classify your map.)

7.12.1. Standard Symbols for Map Preparation. The following annotations and symbols will be used in preparing maps for both combat and non-combat operations

7.12.1.1. Waypoint. Use a circle to depict enroute points where the aircraft course is altered or key actions occur. Number waypoints consecutively to facilitate identification

7.12.1.2. Initial Point (IP). The IP is identified by a square centered on the point with sides parallel to the course line. If the IP is simply a coordinate, position a dot on the coordinate location centered within the square.

7.12.1.3. Objective Point (OP). The OP is identified by a triangle centered on the planned point with the apex pointing in the direction of flight.

7.12.1.4. NIB (Optional). NIBs are designed to give the crew the required navigational data from the present waypoint to the next waypoint. The following information will be included in NIBs:

7.12.1.4.1. To Waypoint. The number designator of the next waypoint.

7.12.1.4.2. Heading to the next waypoint.

7.12.1.4.3. ETE. The time to the next waypoint.

7.12.1.4.4. MSA. Minimum safe altitude for each leg.

7.12.1.4.5. Distance.

7.12.1.4.6. Fuel.

7.12.1.5. Emergency Landing Bases. Use a single circle with a diagonal line to identify those airfields compatible with unit aircraft to serve as emergency landing bases. Alternate Recovery Bases. Use two concentric circles to identify those airfields with compatible unit aircraft which are preferred for recovery in case the primary base is unusable because of weather, damage, or other reasons. Connect this symbol to the planned course by a dashed line depicting the alternate course from either a planned divert point or from the primary recovery base.

7.12.1.6. Recovery Arrow Box. Use a horizontally divided arrow box pointing in the general direction of the alternate recovery base to provide navigational information to the alternate base. This box depicts base name, distance in NM from divert point to alternate base, command and control communications, and the course from the divert point to alternate base. Estimated fuel required for the recovery may be placed immediately beneath the recovery arrow box.

7.12.1.7. Course Line and Time and Distance Marks. Draw course lines for the entire route inbound to the objective and continue through the return route to the primary and alternate recovery bases.

7.12.1.8. Time Marks. When used, place them on the right side of the course line.

7.12.1.9. Distance Marks. When used, place them on the left side of the course line.

7.12.1.10. Combat Entry Point. A heavy line identifies and locates the point at which the flight route crosses the FEBA or FLOT. The line extends at least 1 inch either side of the course line.

7.12.1.11. Operational Advisory Annotations. Advisory annotations concerning operational aspects of the mission are positioned to the side of the course line. The annotation consists of a line at the point enroute where the function should be performed. The action is noted on the side of the line. The action description may be either enclosed in a box or left open at the discretion of the mission planner. Examples of these operational advisories are: start climb, start descent, IFF and SIF STBY, lights off, lights on, TACAN receive only, start TFA, IFF and SIF ON, and TACAN T/R.

7.12.1.12. Order of Battle (OB). Depict threat information directly on the navigation chart using the following symbols and annotations (Chartpak symbols are recommended):

7.12.1.12.1. Surface-to-Air Missiles (SAM). The number associated with the symbol indicates the specific type of weapon system (SA-2, SA-3, SA-6, etc.). The actual SAM location is at the base of the symbol. Use circles to indicate effective radii of the system at the planned mission altitude. (Symbols are mandatory; radii are optional).

7.12.1.12.2. Antiaircraft Artillery (AAA). Depict known AAA sites and indicate type (e.g., ZSU 23-4, 57mm, etc.).

7.12.1.12.3. Aircraft. Indicate locations of enemy airfields supporting aircraft capable of intercepting the mission. The delta wing symbol indicates all weather capable aircraft and the swept wing symbol indicates clear air mass (CAM) interceptors.

Chapter 8

MISSION EMPLOYMENT

8.1. Formation Flying:

8.1.1. Spacing: During all formation operations, minimum spacing is one rotor disk (exception: maintain a minimum of 100 ft spacing during taxi). Base rotor disk separation on the largest disk diameter when engaged in dissimilar formation operations.

8.1.2. Dissimilar Formation. Formation flights with dissimilar aircraft are authorized when participating crewmembers are trained, briefed, and are thoroughly familiar with the other aircraft's performance and tactics.

8.1.3. Communication. Do not initiate formation flight without positive interplane radio communications (exception: communications out procedures). Prior to formation flight, conduct a communications check of all aircraft in the formation.

8.1.4. Aircraft Lighting. Lighting configurations other than those listed below in **Figure 8.1.** are considered non-standard, and must be briefed.

Figure 8.1. Standard Lighting Configuration

	POSITION LIGHTS	WHITE STROBE	RED STROBE	IR STROBE	TIP LIGHTS	SLIME LIGHTS
DAY OVERT	BRIGHT	ON	OFF	OFF	OFF	OFF
NIGHT OVERT	DIM	OFF	CHALK LAST	OFF	60%	A/R
COVERT	OFF	OFF	OFF	CHALK LAST	60%	A/R
BLACKED OUT	OFF	OFF	OFF	OFF	OFF	OFF

8.2. Terminal Operations:

8.2.1. Takeoff Procedures: Recompute TOLD prior to departure if personnel or equipment have been on-loaded in the landing zone.

8.2.2. Landing Zone/AIE Survey Requirements: A landing zone survey is required prior to any landing or AIE to an unprepared area with the following exceptions:

8.2.2.1. Water AIEs with no live deployments

8.2.2.2. When a high and low reconnaissance is accomplished prior to landing/AIE (Note: the low reconnaissance may be accomplished on final approach provided OGE power is available)

8.2.2.3. During an operational mission where, in the judgment of the PIC, the accomplishment of the high and low reconnaissance would degrade mission accomplishment

8.2.2.4. During successive approaches where conditions are equal to or less stringent than a previous approach to the same area

8.2.2.5. When a Landing Zone survey is required, use the following procedures:

8.2.2.5.1. Units will conduct, and all aircrew should be familiar with, the HLZ programs described in AFI 13-217 AFSOC Sup 1.

8.2.2.5.1.1. It is the responsibility of all aircrew or ground personnel to notify the POC for the unit HLZ survey program of any changes to existing HLZs in a timely manner.

8.2.2.5.2. A thorough review of the landing zone survey and accompanying photography / imagery will be accomplished by all crewmembers during the aircrew brief. The aircraft commander is responsible for ensuring that any crewmember that was unable to attend the brief either reviews the landing zone survey or is briefed on the hazards associated with the HLZs.

8.2.3. For the first approach into any unprepared landing zone, select all available hover symbology prior to commencing the approach (MH-53M). In MH-53J aircraft, the decision to select symbology on the HDD rests with the PIC, however, GVR must be selected by both pilots. EXCEPTION: Coupled approaches

8.2.4. If any degradation in on-board systems (hover indicators, HDD, doppler, radar altimeter, etc.) is discovered which could result in loss of situational awareness during approach/hover, the PIC will inform the crew. The decision to proceed rests with the PIC.

8.2.5. Ensure scanners clear the flight path before beginning a descent. Avoid descent rates greater than 300 feet per minute during the final portion of the approach and landing.

8.2.6. Go-Around Calls. If any crewmember calls "go-around", the pilot flying will immediately execute a maximum power climb until clear of all obstacles. (Exception: The pilot flying deems the risk of go-around is greater than the risk of landing)

8.3. Alternate Insertion/Extraction:

NOTE: Ensure all operations off the ramp will not exceed aircraft CG limits.

8.3.1. A cutting device will be readily available to cut ropes or AIE devices during emergencies or rope entanglement.

WARNING: The crewmember at the deploying station will ensure the departing team members have removed their restraining devices prior to deploying.

WARNING: Do not use equipment that is certified as, "training use only", for live training.

8.3.2. Mission Briefing. Prior to deployment or pickup, the PIC will ensure the appropriate briefing for alternate insertion and extraction briefing is completed. Aircrew and team briefings will emphasize proper hand signals, time calls, and emergency procedures.

8.3.3. Hoist:

CAUTION: A survivor who is not familiar with rescue hoist procedures, will be assisted by personnel trained in hoist operations.

8.3.3.1. Hoist Operator. The primary hoist operator must be the FE; however, any crewmember may be designated the hoist operator as the mission dictates. When radio contact is not available,

BY ORDER OF THE COMMANDER
AIR FORCE SPECIAL OPERATIONS COMMAND

AFSOC HANDBOOK 11-201
15 APRIL 2001

Flying Operations

COMBAT AIRCRAFT FUNDAMENTALS - MH-53

OPR: HQ AFSOC/DOXT (Maj Charles P. Nussman)
Certified by: HQ AFSOC/DOX (Col Charles R. Lovett)
Pages: 282
Distribution: X (See Attachment 7)

This publication provides a comprehensive single-source document of fundamental employment procedures and techniques used to accomplish MH-53 missions. The discussions on tactical capabilities provide a starting point for building tactical knowledge and skills. This publication is an interim document that will become the MH-53 volume to AFTTP 3-3 in the future. The primary media for distribution is CD-ROM, which contains animated graphics. Paper documents retain references to the animated graphics.

2.3.1.7.1. Element Spacing. Aircraft should maintain the maximum spacing that allows the flight to maintain formation integrity and mutual support. This separation and avoiding the same ground track enhances survivability while allowing mutual defensive suppression. Separation and unique ground tracks may minimize the number of aircraft detected/engaged by enemy air interceptors (AI), antiaircraft artillery (AAA), surface to air missile (SAM) operators/systems, and/or ground/navy units with small arms and light automatic weapons. These techniques may not be possible when acting as pathfinder aircraft.

2.3.1.7.2. Terrain Following (TF) Radar. If formation aircraft are using TF radar, each aircraft should use a different frequency to avoid interference.

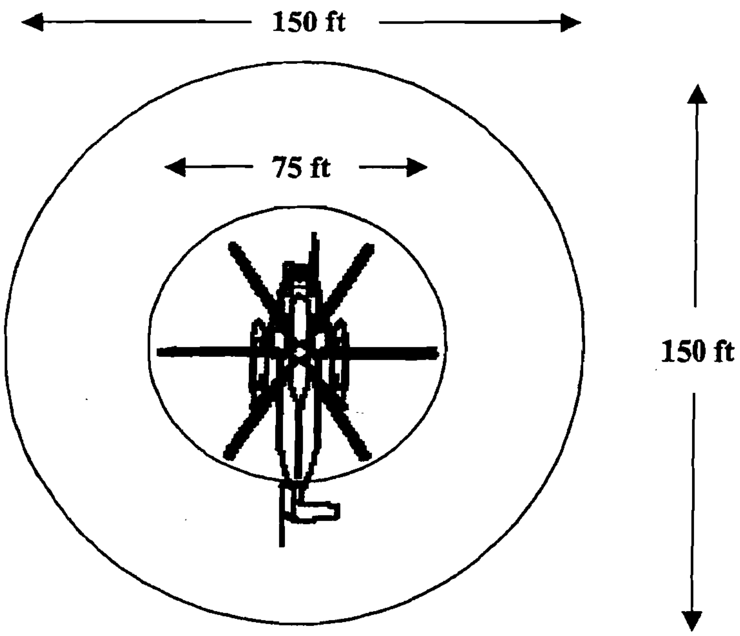
2.3.1.7.3. MH-53 Pathfinder. As pathfinder, the lead MH-53 is responsible for navigation, threat avoidance, and terrain/obstacle clearance for the entire flight. Since the MH-53 Pave Low system provides terrain avoidance (TA) in a .32 NM wide corridor (950 feet either side of centerline), aircraft in trail must exercise strict formation discipline. Brief wingmen to stay in the corridor and to use lead as their attitude reference. Situational awareness (SA) is essential and lead must exercise caution when executing turns "into" a staggered formation. Lead should delay descent commands and use a moderate rate to keep from descending the formation into a ridge. This technique will degrade terrain masking. Lead must consider and compensate for the performance characteristics of dissimilar aircraft in the formation (especially when heavily loaded) when executing formation maneuvers. Higher altitudes and slower airspeeds may be required.

2.3.1.7.4. Inter-plane frequency. Normally, establish a primary and secondary inter-plane frequency. These frequencies are used to pass essential intra-formation information.

2.3.2. Landing Zone Parameters. Critical selection criteria for a landing zone include ground force location, risk to aircraft, and aircrew ease in locating/identifying the zones. The site should be secure, accessible, and permit safe delivery/recovery of personnel and equipment. For training, MH-53 crews should not plan to land in LZs smaller than 150 feet in diameter. Actual operations may require landing in smaller LZs, but no smaller than 125' wide by 140' long. LZs should have minimal slope, be clear of debris, and provide go-around options. Crews should consider the possibility of brown-out/white-out conditions (see paragraph 7.3.8.). In an urban environment, crews should consider the effect of lights on NVG operations, as well as the effects of rotor downwash on manmade objects. During planning, assess hover references in the LZ environment and consider options such as team members exiting from the right door (versus tail) and copilot approaches (versus pilot). See AFSOC Supplement to AFI 13-217 for more information on LZ operations. Figure 2.6. shows LZ training requirements. Figure 2.7. shows operational LZ requirements. Special tactics planners can help with computer-aided products, which may detail exact aircraft position for inside the LZ.

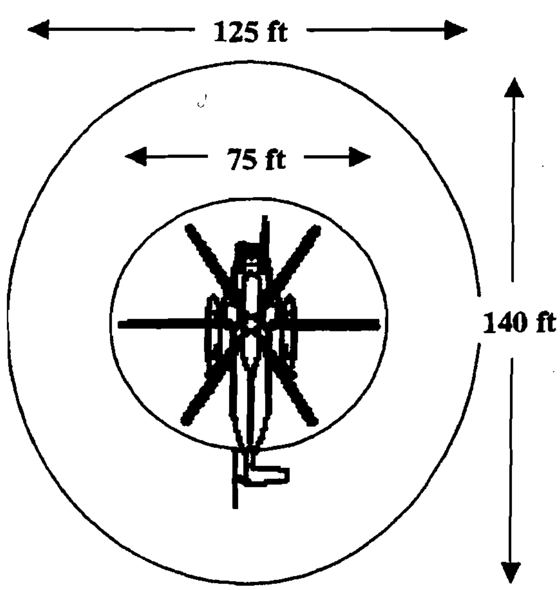
2.3.2.1. Landing Zone Marking. Pre-brief a plan with your customer for marking the LZ. Typically, MH-53 crews prefer no LZ identification markings, however, teams may use one IR strobe, a spinning Chem-Lite, or other pre-briefed marking devices.

Figure 2.6. Training LZ Requirement.



MH-53 PAVE LOW

Figure 2.7. Operational LZ Requirement.



MH-53 Pave Low

2.3.2.2. Aircraft Authentication. The team can use the aircraft arrival at the LZ at the time on target (TOT) and approach heading/course as authentication or may use another pre-briefed means. Avoid duplicating authentication methods within any particular scenario.

2.3.2.3. Alternate Landing Zones. Assessment of alternate LZs should be an integral part of pre-mission planning. Alternate LZs may be used when the threat, weather, or other unfavorable conditions preclude use of the primary LZ. The alternate LZ should be located as close as possible to the primary ingress route and heading. A separate TOT should be established and coordinated with all affected parties.

2.3.2.4. Landing Zone Deception. False infil/exfils in the same area are effective in confusing the enemy and disrupting their movement toward the actual LZ. LZs for deceptive infil/exfils should meet the requirements of an actual LZ. Deception should be thoroughly planned and coordinated, use strict security procedures, and be executed wisely. The use of deceptive LZs may increase exposure of aircraft and forces to enemy reaction. Paragraph 2.3.6. provides additional information on deception.

2.3.2.5. Urban Landing Zones. Urban areas present different problems for helicopter crews. City lights may prevent identification of LZ lighting or authentication markers/signals. Enemy forces may react to urban operations more quickly due to efficient road and street systems. Urban LZs present greater hazards to the helicopter in terms of light poles, towers, wires, and buildings. This may necessitate a slower, steeper approach into the LZ. When operating in urban areas, aircrews should conduct a detailed pre-mission study of the LZ to include city maps and overhead imagery, if available. Tennis courts, parking lots, athletic fields, and rooftops provide suitable areas for infil/exfil. If possible, select prominent LZs. Football stadiums are easier to locate than tennis courts. Depending on the threat, the AC-130H/U gated laser intensifier (GLINT) may prove effective in locating an urban LZ. Alternate methods of authentication, such as secure communications, may prove necessary since light signals may prove ineffective. The key to successful urban operations is flexibility and safety.

2.3.3. Alternate Insertion Extraction. Mission plan to use an alternate, insertion, extraction (AIE) method in the event a landing cannot be accomplished. This allows the crew to pre-brief procedures with team members, configure equipment and compute hover and landing power requirements.

2.3.3.1. Fast Rope. Fast rope rapidly deploys a large number of personnel. The procedure can use up to three 2-inch, interwoven ropes suspended from attachment points on the helicopter. The ropes come in four lengths: 45, 60, 90, and 120 ft. As the aircraft establishes a hover, the rope is deployed. Several people can be on a rope at the same time. Fast rope is second to landing as the fastest infil method. Ideally, the deploying team provides the rope. When fast-roping to a building top from the ramp, if the aircraft nose is close to or past the roof edge the radar altimeter may give inaccurate data. Therefore, the primary employment station is the right door for building top fast rope. Deploying from the door also ensures the tail gun is available, with its greater field of fire, to bring to bear on incoming ground fire. The helicopter may be rotated around the insertion device to move the covering fire fan.

engagement. Wingmen should position themselves so they can see both the preceding aircraft and the terrain they are over flying, through their NVGs without head movement.

Figure 3.2. Trail Formation.

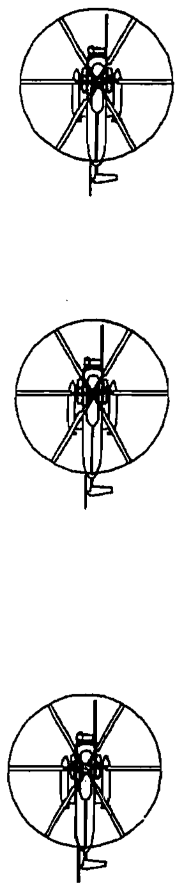
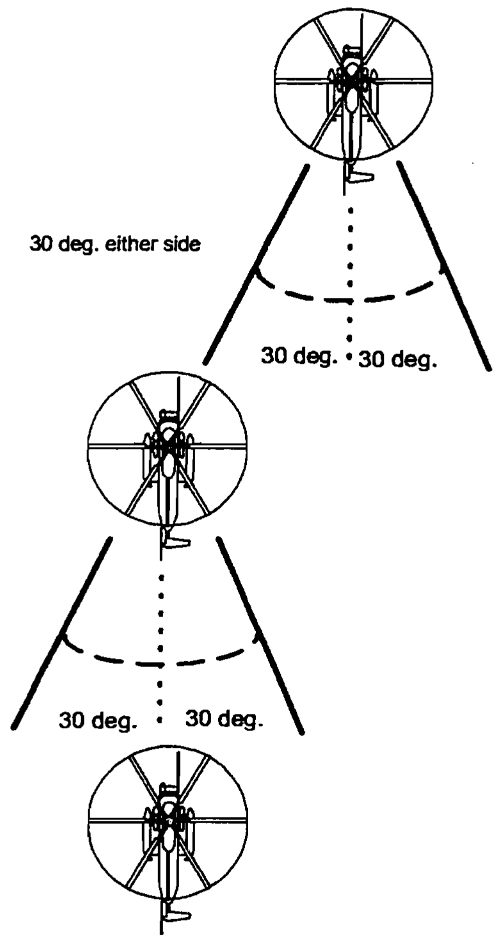
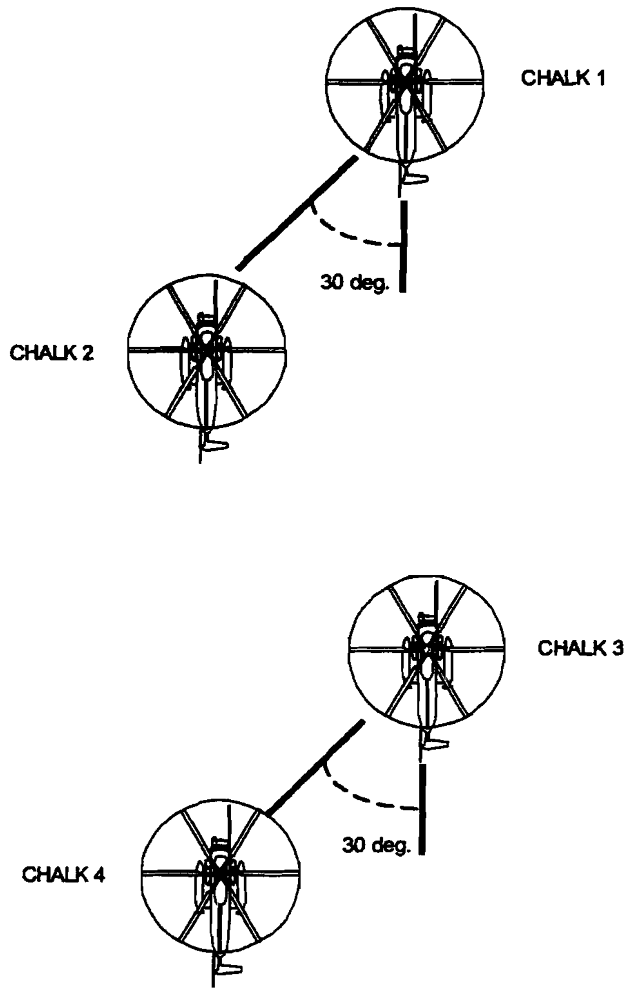


Figure 3.3. Fluid Trail Formation.



3.5.2.4. Staggered Formation (see Figure 3.4.). Staggered formation is a fixed version of fluid trail used to allow flight lead more control of the formation configuration. Odd numbered wingmen will fly in trail behind flight lead. Even numbered wingmen maintain a position approximately 30 degrees offset from the preceding even numbered wingmen. Number two determines the side for all even numbered wingmen. METT-T considerations drive the spacing between aircraft. Staggered formation is particularly useful for maintaining formation integrity when maneuverability is also important. Advantages of staggered formation include a fixed position of wingmen, flight lead maneuverability, and large groups of helicopters can land together in a relatively small area. Disadvantages include greatly increased fuel consumption for number three and subsequent wingmen, and difficulty keeping the preceding two aircraft in sight at the same time (on NVGs).

Figure 3.4. Staggered Formation.



3.5.2.5. Combat Cruise Formation. (Two-ship only) (see Figure 3.5.). Combat cruise provides maximum flexibility and individual pilot freedom to maneuver, apply lookout doctrine, and terrain mask. The wingman flies on an arc from the abeam position through trail on either side of flight lead. Unless METT-T considerations dictate otherwise, the preferred position for the wingman is 45 degrees aft of flight lead. Minimum spacing is 500'.

3.5.2.6. Combat Spread Formation. (Two-ship only) (see Figure 3.6.). In combat spread formation, the wingman maintains a position 10-20 degrees aft of the abeam position of flight lead. Minimum spacing is 500'. Combat spread requires high illumination for NVG operations and is normally flown over flat terrain where masking options are limited. Also, combat spread is the most advantageous formation for possible airborne threat engagements. Disadvantage of combat spread are number two's difficulty noticing flight lead's turns and situational awareness during evasive maneuvers.

Chapter 7

LOW ALTITUDE OPERATIONS

7.1. General Procedures:

7.1.1. The tail skid should be retracted for any (personnel/equipment) drops from the ramp.

7.1.2. Cockpit crewmembers will select hover symbology for display prior to the first approach into any unprepared landing zone.

7.1.3. Fast Rope Insertion/Extraction System (FRIES) type extractions are not authorized.

7.2. Area and Site Evaluation. Refer to AFI 11-2MH-53 Volume 3 for exemptions to landing zone survey requirements. The site evaluation consists of a high and low reconnaissance. Terrain, wind, obstacles, and emergency landing areas dictate the pattern flown to a landing site. Plan the pattern to remain oriented in relation to the wind and intended landing area. Although there is not a standard pattern that covers all situations, a rectangular or modified rectangular traffic pattern should be flown. Flying around a pinnacle landing area at a constant altitude may be required to afford a view of the site from all possible angles. This reconnaissance may also reveal areas of updrafts and downdrafts, indicating wind speed and direction. Execute as many flybys as necessary. Complete power available checks prior to commencing the low reconnaissance, if required. Tactically qualified crews may conduct high and low reconnaissance day or night (on NVGs). When site evaluations are required, conduct the evaluation as follows:

7.2.1. High Reconnaissance. The high reconnaissance is flown at approximately 300 feet above the site, offset and into the wind (if direction is known). Minimum airspeed is 50 KIAS. Table 7.1. shows the evaluation requirements for high reconnaissance.

Table 7.1. High Reconnaissance Evaluation Requirements.

Free air temperature and site temperature (evaluate 'bubble effect' potential).	
Power available and power required (IAW AFI 11-2MH-53, Vol 3).	
Site elevation.	
Area suitability: size, slope, and surface.	
Landing surface composition	
	Debris (e.g., wires. branches).
	Irregular surface features (e.g., rocks, stumps, ruts).
Wind direction.	
Turbulence.	
Approach and departure routes.	
Escape route.	

7.2.2. Low Reconnaissance. The low reconnaissance allows refinement of items noted in the high reconnaissance. The pilot should fly the low reconnaissance as nearly as possible on the same approach angle and route selected for the final approach. The low reconnaissance serves as a "practice approach" to aid in determining the safest final approach. If the selected approach route is not satisfactory, select another route and execute another low reconnaissance. Pilots may descend to a minimum of 50 feet above the highest obstacle along the flight path. Fly to the left side of the site at a minimum of 50 KIAS and reconfirm items reviewed on the high reconnaissance.

7.2.3. Site Evaluations Without a High and Low Reconnaissance. At the pilot's discretion, the low reconnaissance may be performed on final approach if "OGE power" is available.

7.3. Approach Tactics, Techniques, and Procedures:

7.3.1. General. Standard approach maneuvers are intended for use on all missions; however, these standards may not reflect the optimum performance required for terminal operations. There is no one approach that should be used for every situation. Obstacle height in and around the landing site determines the type, angle, and direction of approach. Larger obstacles will require larger landing areas or additional power. The period of transitioning from forward flight to hover flight is the most difficult part of any approach. As helicopter performance decreases, select an approach angle that will make transition more gradual. Prior to attempting an approach, aircrews should attempt to establish a specific final approach entry altitude to provide a familiar sight picture. A normal approach should be considered in almost all cases. A steep approach requires the pilot to stop the rate of descent at the same time the helicopter is coming out of translational lift, which may require more power than is available. However, a steeper than normal approach may be required for adequate clearance of obstacles and avoiding null areas (due to wind). A shallower than normal approach allows the rate of descent to be stopped prior to the loss of translational lift. This allows entering ground effect with the pilot in full control of the sequence of events. Terminal area approaches require constant vigilance of the entire crew. Continually compare indicated airspeed and ground speed prior to actual touchdown. Be prepared for a go-around at all times. At remote sites, always anticipate, and be prepared for, an instrument touchdown. On short final, before the helicopter is committed to land, analyze these three variables: proper rate of closure with translational lift; rate of descent under control; and power smoothly increasing, but below hover power.

WARNING: To prevent the possibility of entering power settling during remote area approaches, do not exceed the vertical velocity limits established for the type approach flown.

7.3.2. Crew Coordination. Crew coordination is crucial to the successful accomplishment of terminal area operations. At the pilot's discretion (or earlier if required), the flight engineer (FE) or scanner will commence clear, concise, coordinated directions, and commentary on the progress of the approach and landing. The verbiage used is similar to that used for hoist operation. The FE or scanner must be able to quickly discern deviations and provide on-the-spot directions to the pilot. As the approach proceeds closer to the landing area, directions should become more detailed with emphasis placed on obstacle clearance. Once below the level of the obstacles, the pilot should not move the aircraft in any direction until clearance from the scanners ensures safe operation in the specified direction.

7.3.3. High Density Altitude Considerations. All available information must be used to safely accomplish operations in a high density altitude (DA) environment. Temperature has the greatest effect on DA. For every 1 degree centigrade increase in temperature, the DA will increase approximately 120 feet. An increase in humidity will also increase DA. True airspeed is directly related to DA. With a constant indicated airspeed, an increase in DA will result in an increase in true airspeed. The following factors must be carefully considered:

7.3.3.1. Power Settling. The pilot must make smooth control inputs, employing finesse, while operating at high DA. Rapid or excessive aft cyclic will greatly increase the induced drag factor on the rotor system. This additional drag will directly impact the power required to maintain airspeed and vertical velocity (rate of descent) and could lead to the onset of power settling. Once power settling is encountered, recovery can only be accomplished by lowering the collective and nose to gain airspeed (reducing power required). This will result in the loss of considerable altitude.

7.3.3.2. Translational Lift. A premature loss of translational lift can result in limited options or a crash if OGE power is not available. At high DA, the indicated airspeed (IAS) and true airspeed (TAS) relationship is significant. On final approach at high DA, you will lose translational lift at an earlier stage. Similarly, you will achieve translational lift at a later stage on go-rounds or takeoffs. Also, inertia is related to TAS, not IAS. The aircraft appears to take longer to decelerate at higher altitudes. Plan for longer finals and expect to bring the power in earlier during the approach. If power is marginal, avoid winds from the right. Also, remember the best abort route is to the right, terrain permitting.

7.3.3.3. Power Available. Determine the actual altitude of the site. If a radar altimeter is installed and operative, fly directly over the site and cross-reference the radar altimeter with the barometric altimeter (set to 29.92" HG) to determine the pressure altitude and confirm the elevation of the site. The aircraft commander normally assigns this responsibility to the copilot. Accomplish the power available check prior to the low reconnaissance. If a difference is noted between planned and actual pressure altitude, re-compute the power available. Use caution when flying in DAs you are not used to. The limiting factor may change from torque to turbine speed or exhaust temperature.

7.3.3.4. Bubble Effect. Temperature, terrain, and weather can significantly effect surface temperatures. High DA, clear skies, and vegetation can cause a bubble effect on mountain tops that can result in surface temperatures 8-15 degrees centigrade warmer than the surrounding terrain. If bubble effect is suspected, plan power requirements based on a possible higher temperature.

7.3.3.5. Approach. Prior to the approach, brief all crewmembers on the specific approach procedures, pilot's intentions, significant terrain features, crew requirements, and abort route. To avoid power settling, do not exceed the vertical velocity limits established for a steep approach, regardless of the type of approach being flown. At any time during the approach conditions do not appear favorable or safe, a go-around should be accomplished.

7.3.3.6. Go-Around Decision. Approach angle (too steep or shallow), excessive movement of controls to maintain angle, and a rate of descent that exceeds limitations will influence the go-around decision.

NOTE: If a go-around is executed in marginal conditions, the possibility of its success is sharply reduced. Total crew involvement is paramount to identify the need, and call, for a go-around in a timely manner. It may be necessary to jettison external fuel tanks to accomplish a go-around.

7.3.3.7. Unable to Go-Around. Table 7.2. shows suggested actions if a go-around is not possible.

Table 7.2. Actions if Go-Around Not Possible.

Hold maximum power.
Do not droop below minimum main rotor speed (Nr).
Descend into ground effect.
As descent continues, select a spot and fly as controlled an approach as possible to touchdown. Do not make abrupt control movements.

7.3.3.8. Table 7.3. shows the effects of high DA.

Table 7.3. Effects of High Density Altitude.

Power available decreases.
Power required increases slightly.
Maximum allowable airspeed decreases.
Control response becomes more sluggish.
Potential for blade stall increases.
Potential for the formation of Vortex Ring State increases.
Potential for power settling increases due to reduced power margin.

7.3.4. Tail Rotor Factors.

7.3.4.1. Table 7.4. shows conditions of maximum demand on the tail rotor, which occur under the same conditions as demand on the main rotor.

Table 7.4. Conditions of Maximum Demand on Tail Rotor.

High DA, especially when combined with high humidity.
High gross weight.
High outside air temperature (OAT).
Hovering out of ground effect.

Low airspeed; especially during takeoff when combined with a left turn.
Steep angles of bank while trying to maintain altitude and airspeed.
Confined areas (due to loss of wind for translational lift caused by descending below a tree or ridgeline).
Hovering over uneven surfaces (part of the rotor system out of ground effect).
Any maneuver requiring high power.

7.3.4.2. Loss of Tail Rotor Effectiveness. Avoid situations that cause the tail rotor to exceed its ability to produce thrust. Power requirements need to be closely monitored and applied with care. Early recognition of loss of tail rotor effectiveness is essential to successfully and safely initiating corrective action. In general, there are four conditions that contribute to loss of tail rotor effectiveness.

7.3.4.2.1. High Power. Any maneuver that requires high power and therefore high tail rotor thrust can cause tail rotor problems. When the rotor system demands more power than the engines can produce, the main and tail rotor RPM will begin to decay. As the tail rotor RPM decays resulting in insufficient thrust available to maintain heading, the nose of the aircraft will yaw to the right. Left pedal corrections at this point will only continue to aggravate the situation. If tail rotor stall occurs, it will cause an abrupt yaw to the right. To recover, you must initiate a go-around by lowering the collective, increasing airspeed, and initiating a right turn if possible. For the recovery to be successful, the pilot must recognize the situation early enough to ensure sufficient altitude for a safe go-around.

7.3.4.2.2. Decelerative Attitude and Low Airspeed. A decelerative attitude may result in a combination of downwash from the main rotor and turbulence from the horizontal stabilizer. Low airspeed and high power setting also increases main rotor turbulence through the tail rotor. In both cases, more left pedal is required to maintain aircraft heading. This increases the potential for loss of tail rotor effectiveness.

7.3.4.2.3. Left Crosswind or Left Sideward Flight/Right Pedal Turn. These conditions could cause the tail rotor to operate in turbulence similar to the main rotor during power settling. Left sideward velocities of 5-35 knots can cause the tail rotor to work in its own wash. As a result, maintaining directional control is difficult due to large variation in tail rotor thrust. These phenomena are referred to as vortex ring and tail rotor breakaway. To correct the problem, slow or stop sideward flight/pedal turn and gain airspeed.

7.3.4.2.4. Right Crosswind or Right Sideward Flight/Left Pedal Turn. A right relative wind acting on the fuselage area tends to push the tail to the left requiring more tail rotor thrust to maintain heading. When the aircraft is flown in conditions such as higher gross weights, higher right relative wind, higher DAs, and/or higher humidity left pedal authority may be exceeded. To correct the situation, gain airspeed and/or initiate a right turn, if possible. Running out of left pedal is the most common tail rotor problem.

7.3.5. Tactical Approach. The tactical approach is more demanding than any other approach and may involve constant change of approach angle, airspeed, and rate of descent. Keep the crew informed of position in the approach. This enables the crew to clear the flight path for the pilot.

WARNING: H-53 aircraft roll faster to the right than they do to the left. This condition is made worse at speeds approaching effective translational lift (ETL), in turns, and at combinations of high density altitudes and high weights. Use caution during tight right turning approaches and begin an early roll out to allow for reduced aircraft reaction time. Left cyclic authority may not be sufficient to quickly roll out of the right roll.

7.3.5.1. Approach Planning Factors. Consider the following factors:

7.3.5.1.1. Plan an abort route, preferably downhill or into the wind without climbing. If it is necessary to turn during an abort, a right turn is preferable (terrain permitting).

7.3.5.1.2. Avoid high rates of descent during approach.

7.3.5.1.3. Be alert for wind shifts and downdrafts.

7.3.5.1.4. Monitor rotor RPM and power throughout the approach.

7.3.5.1.5. A landing site with obstacles on the upwind side creates a null area (area of no wind or, in some cases, a downdraft). If marginal performance is anticipated, avoid null areas. Never plan an approach to a confined area where there is no reasonable route of departure.

7.3.5.1.6. Power required performance charts in applicable flight manuals are based on a hover over level, nonporous surfaces. When landing in unprepared sites, aircrews should be aware of increased power requirements when hovering over tall grass, slopes, and obstacles in close proximity to the aircraft.

7.3.5.2. The tactical approach may be started from any position in relation to the landing/hover area. Be aware of tail rotor clearance throughout the deceleration phase. Align the final portion of the approach into the wind, if possible. At high density altitudes with heavy gross weights, anticipate blade stall. Anticipate power increases prior to completion of decelerations. To avoid power settling, do not exceed the vertical velocity limits for the type approach being flown. Constantly monitor main rotor RPM to prevent overspeed of the main rotor.

7.3.5.3. Exercise care when decelerating in a low-level environment. During a low level deceleration above 50 feet, it is permissible to rotate the helicopter around the transmission. See Figure 7.1. When flying a terrain profile and maintaining 50 feet obstacle clearance, rotate the helicopter around the tail rotor. Accomplish this by increasing collective to maintain tail rotor altitude and then applying aft cyclic to decrease airspeed. See Figure 7.2. If deceleration begins above 50-foot obstacle clearance, apply aft cyclic and lower the collective to begin descent to your intended hover altitude. In either case, extreme caution must be used when descending below 50 feet and on the approach to prevent the tail rotor from contacting the ground.

WARNING: Power required increases as the helicopter decelerates (reference Flight Manual).

Figure 7.1. Rotate Around Transmission. (Click on figure to view animated graphic.)

Figure 7.2. Rotate Around Tail Rotor. (Click on figure to view animated graphic.)